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# METEOROLOGICAL SERVICE, DOMINION OF CANADA.

## Monthly Weather Review.

VOL. XXVI

JANUARY, 1902.

No. 1

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### REMARKS UPON THE WEATHER.

The weather of January was characterized by unusually high mean temperatures in Manitoba and the North-west Territories, where there was much bright sunshine, also light precipitation throughout the country, with a few local exceptions. There were also other departures from the normal but they were generally unimportant. At the end of the month the ground was well covered with snow throughout the Dominion, excepting in southern New Brunswick, Nova Scotia, and Prince Edward Island, where the ground was bare.

In British Columbia the weather did not depart much from the normal, but it was somewhat milder and drier, and there was more bright sunshine than usual throughout the greater portion of the province. After a gale on the 24th, the weather turned quite cold, and continued so until the 31st. On the Lower Mainland several early spring flowers were in bloom about the 15th; on the last day of the month, however, the ground was covered with snow.

The weather in the North-west Territories was unusually dry and exceedingly mild, the departures from average in the mean temperatures being from 9° to 15° in excess. There was also considerably more bright sunshine than usual, fine bright mild days being almost continuous during the first half of the month. On the 23rd a cold wave set in, and very cold weather prevailed to the 31st. In most districts there was insufficient snow for sleighing, and during the greater part of the month cattle were feeding out on the prairies.

In Manitoba the weather conditions were similar to the conditions in the Territories, exceptionally high mean temperature and light precipitation being general. There was, however, not quite so much bright sunshine, although it exceeded the average. On or about the 6th the temperature was between 40° and 50°, and up to the 23rd, readings below zero were seldom recorded. There was not sufficient snow for sleighing during the month, but on the last day the ground was lightly covered in most districts.

In Ontario the chief characteristic of the weather was light precipitation generally, with a few local exceptions. Somewhat mild weather prevailed in most districts, but in many places, more especially in the western portion, the mean temperature on the contrary was a little below average. In eastern counties there was not quite so much bright sunshine as usual but elsewhere the proportion exceeded the average. The most important storm of the month occurred on the 22nd, when there was a heavy fall of snow in southern and eastern counties. In the southern portion of the Province there was a marked absence of temperatures below zero. There was sufficient snow for good sleighing throughout the greater portion of the month.

The weather in the Province of Quebec was generally milder than usual in the eastern portion, also in some districts in western counties, but at a few places the mean temperature on the contrary, was a little below the average. The precipitation also varied with the district, it being slightly deficient in some localities and excessive in others. High winds were rather frequent, and there were heavy falls of snow on the 21st and 22nd. At Quebec and eastward from this place, the depth of snow on the ground on the last day was about the same as at this date last year.

The weather in New Brunswick was exceptionally mild and dry, the mean temperature being above average, and the precipitation considerably below. Altogether the weather was exceedingly enjoyable, much bright sunshine and light winds occurring frequently. In the southern portion the ground was almost bare up to the 8th, and after the 22nd it was completely so. In northern districts, however, there was sufficient snow for good sleighing. Five gales were recorded during the month.

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In Nova Scotia the weather conditions were somewhat similar to the conditions in New Brunswick, the mean temperature exceeding the average and the precipitation being deficient. Fresh to strong winds, however, were more frequent and much of the precipitation was rain. At some places there was sufficient snow for sleighing during a portion of the month, but in most localities the ground was bare on the 31st.

The weather in Prince Edward Island, as in the two last mentioned Provinces, was characterized by high mean temperatures and deficient precipitation, fine bright days occurring frequently. Temperatures below zero were not recorded, although zero was reached at two stations. The ground was bare during the greater part of the month, the snow which fell being soon melted.—F. F. PAYNE.

### ATMOSPHERIC PRESSURE.

The mean pressure of the month did not differ much from normal in any portion of the Dominion, except British Columbia, where positive departures ranged between one-tenth and fifteen-hundredths of an inch. The area of highest mean pressure lay over the North-west Territories and southward of the 49th parallel, and the barometric gradient from the western portions of the Lake Region to the Gulf of St. Lawrence was very nearly normal, the area of lowest pressure lying over Newfoundland and east.

### HIGH AREAS.

There was a large amount of high pressure during the month, many of the nine areas charted being of widespread proportions and of considerable duration.

No. 1 covered the Lake Region on the morning of the 1st as an important area attended by decidedly cold weather in Ontario and Quebec. It then passed southward with decreasing energy and dispersed. No. 2 was situated over the North-west States and Territories on the morning of the 2nd, whence it spread over the greater part of the continent, its centre being ultimately transferred to the Lower St. Lawrence Valley and the Gulf of St. Lawrence. During the presence of the system, fair cold weather generally obtained in Canada; Manitoba recording 20 degrees below zero on the 3rd, Ontario 2 to 18 below, and in Quebec below on several nights, more especially in the eastern portion. No. 3 moved on to the North Pacific Coast on the night of the 8th; on the 10th and 11th, it was centred over Wyoming and its vicinity. On the 12th, the highest pressure covered Manitoba, whence the system moved southward and passed off the South Atlantic Coast on the night of the 14th; no very cold weather attended this area, only a few degrees below zero occurring in northern localities. No. 4 was a moderate area which passed over the Continent between the 14th and 18th, from the North Pacific States to the South Atlantic Coast. On the night of the 16th during its presence low temperatures were generally recorded in Ontario, Quebec, and northern New Brunswick. No. 5 was situated on the Middle Pacific Coast on the morning of the 17th, and afterwards travelled over the Continent, passing off the Nova Scotian Coast on the night of the 20th. On the 19th it was accompanied by decidedly cold weather from Ontario to the Maritime Provinces, especially in the Ottawa Valley, Quebec and in northern New Brunswick. No. 6 appears to have formed on the British Columbia Coast on the 19th. It was a very moderate area and its course was south-eastward over the Continent, arriving on the South Atlantic Coast on the 24th. No. 7 was another very feeble area which travelled between the 21st and 24th from British Columbia to the Mississippi Valley, and then lost its identity. No. 8 was an important area which moved into the North-west Territories during the evening and night of the 23rd, and on the 24th was centred in Alberta, the temperature ranging at the same time from 18 to 30 degrees below zero from the Rocky Mountains to Manitoba, the first widespread severe cold wave of the month in these districts, and the beginning of what transpired to be a protracted cold period. By the evening of the 25th, an offshoot of the system had been seemingly transferred to Quebec, and on the night of the 26th, it passed off the Coasts of the Maritime Provinces. Zero weather was generally recorded in northern Ontario on the night of the 24th, and on the following night in the northern parts of Quebec and New Brunswick. No. 9 was centred in the North Pacific States on the 25th and no doubt was closely allied to No. 8, if not a part of the same system, it spread over the greater portion of the Continent, the main area gradually progressing eastward until on the evening of the 31st it had reached the Maritime Provinces. Cold wintry conditions generally obtained in Canada during these latter days of the month, and some low minima temperatures were recorded, noticeably throughout the period in the Territories and Manitoba, and between the 28th and 31st in Ontario, Quebec and the Maritime Provinces.

### LOW AREAS.

Eleven areas of low pressure were charted, and there were besides several minor depressions of erratic movement which have not been considered. Nos. 10 and 11 were the most pronounced disturbances of the month.

No. 1. was situated over the Qu'Appelle Valley on the morning of the 1st, whence it travelled quickly over northern Canada and passed into the Gulf of St. Lawrence on the 3rd. It was an energetic area, and caused

strong winds and gales from the Lakes to our Atlantic Coast, together with some light snowfalls in Ontario and Quebec, and light snow and rain in the Maritime Provinces. No. 2 was a very shallow depression which moved slowly between the 2nd and 6th, from northern British Columbia to Lake Superior, and then dispersed. It brought a few light local snowfalls or flurries as far east as western Quebec. No. 3 was in many respects similar to the last mentioned area, first appearing as it did in northern British Columbia and dispersing over Lake Superior. It caused between the 5th and 6th, high south and west winds in the Territories and Manitoba, also some light scattered showers of snow or sleet as far as the Lower Lake Region. No. 4 was situated in northern British Columbia on the morning of the 7th, and broke up on the 10th after leaving the North-west Territories; it gave a few light local snowfalls only. No. 5 apparently originated in the West Indies, a depression being shown near Jamaica on the 5th. Between the 7th and 8th it passed to the westward of Bermuda, and on the 9th skirted the Nova Scotian Coast, causing over the Maritime Provinces an easterly to northerly gale, together with a heavy fall of snow. No. 6 was first shown on the evening of the 10th, near the Straits of Mackinaw, where it appears to have developed. On the 11th it moved southward over the Lower Lake Region with increasing energy, a subsidiary development at the same time occurring near the Middle Atlantic Coast. On the morning of the 12th, the system was centred in the Bay of Fundy, as a severe storm travelling during the day north-eastward towards the Straits of Belle Isle. It brought high winds and gales from the Lake Region to our Atlantic Coast, attended by a fall of snow in Ontario and Quebec, which was locally heavy, and by snow and rain in the Maritime Provinces. No. 7 was an area of very moderate energy which appeared in the North-west Territories on the 11th, and after moving slowly over Canada it passed on the 16th into the Gulf of St. Lawrence. It caused practically no precipitation in the western portion of Canada, but from the Lakes to the Maritime Provinces it was accompanied by light snowfalls. No. 8 travelled from Texas across the Gulf of Mexico to Florida, thence out to sea passing to the northward of Bermuda, and did not affect Canadian weather. No. 9 was situated in Alberta on the evening of the 15th, it travelled south-eastward to Lake Michigan, thence over the Lower Lake Region and the Ottawa and St. Lawrence Valleys, and on the 19th reached the Gulf of St. Lawrence. It gave light local falls of snow and high winds in Ontario, and a general light snowfall in Quebec, and light snow and rain in the Maritime Provinces. No. 10 transpired to be the most important area of the month. It seemingly originated on the 18th on the Middle Pacific Coast, but had not assumed any marked proportions until the night of the 19th when it reached northern Texas. Its course was first eastward to Tennessee, thence north-eastward over the States bordering the Atlantic Ocean to New Brunswick and into the Gulf of St. Lawrence. It caused a gale from Ontario to our Atlantic Coast, a heavy snowstorm at the same time occurring from Lake Ontario to eastern Quebec and heavy rains in the Maritime Provinces. The snowfall near Lake Ontario was one of the heaviest falls on record, but over the northern and western parts of the Province there was little or none. No. 11 was also of much importance and like its predecessor it first appeared on the Middle Pacific Coast. After reaching the neighbourhood of Indian Territory and northern Texas on the evening of the 25th, the main disturbance was suddenly transferred northward, and on the morning of the 26th the system was centred over Lake Superior, whence it travelled far north over Ontario and Quebec, and on the night of the 27th passed into the Gulf of St. Lawrence. It was attended by strong winds and gales from Ontario to the Maritime Provinces together with snow and rain, the precipitation in the Maritime Provinces being altogether rain.

#### WINDS.

In Vancouver Island and the Lower Mainland the winds were chiefly northerly and the mileage was less than the last three years. Two gales were recorded at Victoria, one between the 5th and 6th, the other on the 24th.

In the North-west Territories and Manitoba the direction was largely westerly; strong breezes were not of frequent occurrence but fresh winds were more or less general, especially in the Territories.

In the Lake Region no one direction was especially marked, the westerly being if anything the most prevalent. The force of a gale was reached on five occasions and besides there were seven days of strong, and thirteen days of fresh winds.

In the Ottawa and Upper St. Lawrence Valleys the direction was about the same as in the Lake Region and the force also did not differ much except that the days of strong breezes were more numerous, and those of fresh winds not as frequent as in the Lakes.

In the Lower St. Lawrence Valley, the Gulf, and the Maritime Provinces, the westerly direction was the most general. Fresh to strong breezes were of frequent occurrence, and there were besides six gales, as follows:—The 1st, a continuance of the north-west gale which set in during the night of the 31st of December and on the 3rd, 8th, 12th, 22nd and 27th. The gales were all of a fresh to heavy type in the Maritime Provinces where winter navigation is pursued, and they were all successfully warned, exclusive of the gale of the

1st, which has been already considered in last December's Review. A cautionary warning, however, which was issued on the 17th, was seemingly not justified by subsequent high winds, although a heavy sea was reported along the Nova Scotian Coast. The *St. John Star* under date of Feb. 1, 1902, says:—"Last month saw 1 disturbances passed close enough to the Maritime Provinces to cause dangerous gales on the Coast, but no disasters occurred, owing, no doubt, to the warnings and forecasts issued by the Canadian Meteorological Service. The first cold wave of the month reached us on the 28th and was forecasted. Mariners and shippers of perishable goods are greatly benefitted by the information provided by the Service."

### BRIGHT SUNSHINE.

There was more than average sunshine throughout the Dominion, except in the St. Lawrence Valley, where there was a slight deficiency. The highest percentages recorded were 59 and 45 at Brandon and Winnipeg respectively, and 46 at Fredericton; and the lowest 21 at Nanaimo, B. C., and 23 at Kingston. Woodstock, Ont., registered the largest excess from average, and Kingston the largest departure below average.

### TEMPERATURE.

The temperature was very nearly average over the greater portion of British Columbia, and 1 to 2 below in the south-western portion of Ontario. Elsewhere throughout Canada it was above the average, exceptionally so from the Rocky Mountains to Lake Superior, and well above in the Maritime Provinces. The excess amounted to from 9 to 14 degrees in the Territories and Manitoba and from 3 to 5 degrees in the Maritime Provinces.

*The Highest and Lowest temperatures in each Province during January, 1902, were:*

British Columbia,	57° 0 on 11th at Clayoquot,	—28° 0 on 25th at Barkerville.
North-west Territories,	62° 4 on 12th at Lethbridge,	41° 0 on 25th at Banff.
Manitoba,	47° 0 on 6th at Treherne,	—45° 0 on 27th at Bowsman.
Ontario,	57° 0 on 14th at Woodstock,	—50° 0 on 28th at White River.
Quebec,	43° 0 on 22nd at Brome,	—34° 8 on 31st at Chicoutimi.
New Brunswick,	50° 0 on 23rd at Sussex,	—19° 5 on 21st at Chatham.
Nova Scotia,	55° 0 on 23rd at Truro,	—9° 0 on 30th at Port Hastings.
Prince Edward Island,	51° 5 on 24th at Hamilton,	0° 0 on 29th at Hamilton.

### PRECIPITATION.

The precipitation was largely below the average in all parts of Canada except in the Niagara Peninsula, and Ontario east and north east, where it was considerably above the average, and in Western Assiniboia and portions of the Lake Superior Region only slightly above the average. The deficiency was from an inch to two and a half inches over the greater portion of British Columbia and Ontario, and throughout the Maritime Provinces; nearly an inch below in Quebec and about half an inch in the Territories and Manitoba. At the end of the month the whole Dominion, except the Maritime Provinces, was snow covered, the southern portion of Vancouver Island, and the Lower Mainland of British Columbia not excepted, which is unusual; however, the amount was nowhere considerable except in Ontario and Quebec, and in the former Province there was very little south and west of the Georgian Bay and Lake Ontario respectively. This was owing to the fact that the only heavy snowfall of the month did not extend either much west of Lake Ontario or north of Lake Simcoe. Ottawa recorded 30 inches on the ground at the close of the month, Quebec 25 inches, and Father Point 35 inches.

### THICKNESS OF ICE.

NORTH-WEST TERRITORIES AND MANITOBA.—Medicine Hat, 12 inches.

ONTARIO.—Port Arthur, 28 inches; White River, 13 inches; Parry Sound, 12 inches; Southampton, 15 inches; Kingston, 12 inches; Toronto, 15 inches; Georgetown, 14 inches; Orillia, 18 inches; Arden, 20 inches; Stony Creek, 20 inches; Woodstock, 16 inches; Gravenhurst, 19 inches; Barrie, 22 inches.

QUEBEC AND THE MARITIME PROVINCES.—Chatham, 19 inches; Yarmouth, 6 inches; Sydney, 6 inches; Charlottetown, 10 inches; Fredericton, 23 inches; Sussex, 14 inches; Lepreau, 10 inches; Parrsboro, 10 inches.



PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JANUARY, 1902.

Barometer not reduced to Sea Level.

[illegible]

# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JANUARY, 1902.

a. Parameter not reduced to Sea Level. \*Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above Sea Level in feet.	PRESSURE.			TEMPERATURE.			DIRECTION OF WIND FROM						VELOCITY OF WIND			PRECIPITATION.			Days with 10 or more.	No. of Thunder storms.	No. of Auroras.	No. of Fair days.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
				Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Highest observ.	Date.	Lowest.	Date.	Mean daily range.	Mean temperature of day.	Mean relative humidity.	Mean amount of cloud.	No. of days completely cloudy.	N.	N.E.	E.					S.W.	W.	N.W.	C.	Total number of hours.	Mean miles per hour.	Highest days velocity.	Date and direction from.	Amount.	Difference from Average.	Heaviest fall in month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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White River	48 55	81 30	1252	30 05 30 74 29 48 1 26	3 3	1 15 35 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Port Arthur	48 57	89 12	644	30 10 30 80 29 62 1 28	10 9	1 6 7 21 35 0	9	30 0	28 20 0	6	12	50	20	26	18	6	94	294	85	153	744	5 0	13 0	4 8	2 42	1 74 0 28	21 7	0	0
Stony Creek	48 57	89 12	644	30 10 30 80 29 62 1 28	21 4	1 1 18 45 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Onondaga	49 02	78 15	292	30 13 30 82 29 55 1 27	18 3	0 6 35 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Windsor	49 29	78 15	292	30 13 30 82 29 55 1 27	24 9	0 26 34 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Alton	49 30	83 4	1259	30 05 30 74 29 48 1 26	19 0	0 14 35 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
North York	49 32	80 5	1259	30 05 30 74 29 48 1 26	18 0	0 14 35 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
North Prince	49 33	81 25	1259	30 05 30 74 29 48 1 26	22 5	0 1 13 38 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Collingwood	49 33	81 25	1259	30 05 30 74 29 48 1 26	22 5	0 1 13 38 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	20 8	0 5 10 39 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	16 2	1 34 5 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	16 9	3 0 18 30 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	17 6	1 1 10 36 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	16 0	0 6 16 38 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	14 6	1 3 25 35 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	13 7	1 0 31 36 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	13 7	0 8 13 36 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	22 7	0 3 29 38 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	29 3	0 5 13 38 1	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	21 1	0 18 38 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	22 7	0 6 28 37 4	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	21 1	0 4 27 37 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	29 7	2 1 26 41 1	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	21 2	0 8 12 42 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	9 5	8 35 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	18 5	6 39 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	23 0	0 3 20 42 1	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	15 4	5 38 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	13 5	5 35 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	13 6	5 35 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	22 8	1 5 15 40 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	11 3	3 29 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	19 5	3 37 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	19 2	7 35 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	14 4	4 36 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	4 9	3 37 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 05 30 74 29 48 1 26	22 1	2 40 8	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	1 50	-1 23 0 30	8 19	0	0	
Whitby	49 33	81 25	1259	30 050																									

## QUEBEC:

45 30	73 35	187	30 07 30 71 29 17 1 54	13 2	0 8 28 38 0	2	8 5	15 6	4	7	6	5	15	8	7	18	33	1	0	93	33 7	28 W	3 02	-0 08 0 73	15 14	0	0
46 40	72 36	435	30 07 30 71 29 17 1 54	10 1	24 12 0	3	21 0	31 25 1	4	7	6	5	15	8	7	18	33	1	0	93	33 7	28 W	3 02	-0 08 0 73	15 14	0	0
47 59	82 21	296	30 01 30 59 29 04 1 55	12 6	0 1 24 43 0	3	11 5	17 17 1	7	15	1	14	3	5	7	4	12	7	0	62	23 3	27 W	3 05	-0 98 1 30	8 18	0	0



OBSERVATIONS AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
JANUARY, 1902.

STATIONS.	RAINFALL.					SNOWFALL.				Remarks.
	Amount in inches.	No. of Days of or Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month.	Date.	
<b>BRITISH COLUMBIA—</b>	in.			in.		in.		in.		
Glacier .....						36.0	13	7.0	1	
Naas Harbour..	4.75	5	19	1.70	4	37.0	9	9.0	7	
Port Essington ..	11.81	18	11	2.59	10	4.1	3	3.5	29	
Nanaimo ..	3.74	9	18	1.50	6	16.0	4	9.0	24	
Coquitlam ..	3.47	6	22	1.41	5	13.5	3	11.5	29	
Royal Oak.....	3.59	11	17	1.18	6	8.0	3	4.0	29	
Cowfield.....	4.87	10	14	0.99	5	17.7	4	9.0	29	Fog on 8 days.
Goldstream Lake..	5.64	12	15	1.37	8	21.0	4	7.0	24	
Kuper Island ..	4.38	13	13	0.95	7	11.8	5	4.0	24	Fog on 6 days.
<b>N. W. TERRITORIES—</b>										
Beaver Hills, E.						0.8	2	0.5	23	Sudden change to extreme
Beaver Hills, N.E.						1.2	3	0.5	23	cold on 23rd.
Stirling ..						2.0	3	2.0	23 25	Blizzard on 25th.
Strathcona ..						3.0	1	1.2	8	
Calgary ..						2.3	1	1.0	23	
Weyburn ..						2.0	4	1.0	24	End of month from 23rd
Regina ..						4.3	2	2.5	23	very cold.
Didbury ..						1.0	2	1.0	21	
Immistail ..						1.2	4	0.5	21	
Salcoats ..										Mild up to 24th.
Coutts ..						3.5	3	2.0	30	
<b>MANITOBA—</b>										
Norquay.....						1.3	4	0.5	5	24th. Fine, cold day.
Oakbank ..						3.0	4			
Belmont ..							1		22	
<b>ONTARIO—</b>										
Ursa ..	0.96	1	19	0.96	26	31.0	12	5.0	9	
Tyneloch ..			24			5.0	7	2.0	26	
Elmsmore ..	0.10	1	25	0.10	27	18.0	5	12.0	22	
Cuyuga ..			23			18.5	6	8.0	22	
Kitley ..			22			30.5	9	15.0	22	
Deer Park.....	0.05	1	23	0.05	26	20.3	7	16.0	22	
Lion's Head ..	0.79	2		0.68	26					No record of snow.
Oliver's Ferry ..			25			21.0	6	12.0	22	
Watford.....	0.10	1		0.10	26					No record of snow.
Dutton ..			23			13.0	8	6.0	12	
Providence Bay			17			30.4	11	12.0	10	
Dealtown ..	0.38	3	27	0.23	7	2.1	3	1.3	21	
Aurora ..			22			17.8	9	11.6	22	
Scarborough ..			19			13.3	12	15.0	22	
Port Burwell ..	0.11	1	23	0.11	26	15.8	8	7.0	22	
Newburgh ..			26			22.5	5	18.0	21 22	
Lansdowne ..	0.22		24	0.22		7.0	6	2.0	21	
Jermyn ..			25			35.0	6	22.0	21 22	
Sunshine ..			16			19.2	15	1.0	10	
Orangeville ..			22			22.7	9	15.1	22	
Westminster ..			25			5.0	6	5.0	21 22	
Warton ..	0.11	2	24	0.06	10	18.0	6	6.0	12	
Westport ..			15			29.7	16	14.5	22	
Georgetown ..	0.04	1	12	0.04	27	14.2	19	3.3	22	
Arden ..	0.21	1	20	0.21	27	29.0	10	13.0	22	
Emsdale ..			20			14.0	11	2.5	5	
Wyoming ..			27			12.0	4	8.0	12	
Parma ..	0.77	1	23	0.77	21	50.0	8	21.0	21 22	
Wooler ..	0.25	1	25	0.25	26	17.5	5	13.0	22	
Croydon ..			25			32.0	6	18.0	21 22	
Goderich ..	0.20	1	26	0.20	26	20.0	4	12.0	11	
Montague ..			27			20.5	4	16.0	21 22	
Princeton ..	0.57	1	23	0.57	26	14.1	8	4.0	22	
Uxbridge ..	R		24	R	26	31.5	7	24.0	22	
<b>NEW BRUNSWICK—</b>										
Polic Escuminac.	1.85	3	24	1.23	22 23	14.4	4	8.2	9	
Dalhousie ..	0.90	2	24	0.90	22 23	20.0	6	8.0	12	
<b>NOVA SCOTIA—</b>										
Port Morien ..	2.52	7	22	0.74	3	4.0	2	4.0	8	

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF JANUARY, 1902.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria				0 00	0 08	0 32	0 28	0 38	0 38	0 32	0 34	0 21	0 08			
Nanaimo				0 00	0 10	0 26	0 26	0 29	0 28	0 30	0 25	0 13	0 00			
Agassiz				0 00	0 00	0 23	0 16	0 42	0 38	0 34	0 32	0 17	0 00			
Battleford				0 14	0 11	0 52	0 53	0 55	0 52	0 43	0 34	0 04	0 00			
Indian Head				0 00	0 00	0 09	0 46	0 64	0 79	0 70	0 56	0 22	0 00			
Brandon				0 14	0 19	0 66	0 68	0 60	0 71	0 64	0 41	0 01	0 00			
Winnipeg				0 07	0 33	0 49	0 58	0 60	0 60	0 57	0 45	0 12	0 00			
Durham																
Woodstock				0 05	0 23	0 41	0 44	0 42	0 45	0 39	0 35	0 26	0 06			
Toronto				0 01	0 17	0 42	0 41	0 43	0 47	0 47	0 35	0 25	0 07			
Lindsay				0 03	0 20	0 31	0 38	0 32	0 33	0 38	0 30	0 26	0 20	0 10		
Barrie				0 04	0 24	0 33	0 40	0 43	0 41	0 35	0 29	0 17	8			
Kingston				0 08	0 21	0 25	0 24	0 27	0 31	0 28	0 23	0 23	0 06			
Ottawa				0 01	0 19	0 34	0 40	0 52	0 50	0 49	0 37	0 30	0 05			
Montreal				0 00	0 06	0 31	0 37	0 41	0 42	0 45	0 33	0 17	0 00			
Fredericton				0 12	0 41	0 49	0 61	0 62	0 59	0 54	0 46	0 36	0 09			
Mean proportion for month (Constant sunshine being 1.)	0 26	0 21	0 26	0 41	0 40	0 50	0 45			0 33	0 31	0 29	0 23	0 34	0 32	0 46
Difference from average.	0 06	—	0 08	0 09	0 10	0 10	0 03			0 12	0 04	0 05	0 10	0 04	—	0 01
Maximum daily amount	0 80	0 79	0 70	0 90	0 67	0 90	0 88			0 87	0 90	0 99	0 86	0 83	0 88	0 95
Date	10	21	11	20	28	2	7			17	4	19	30	28	19 29 30	30
No. of days completely clouded	14	11	12	5	5	2	6			10	13	13	12	17	10	15

*Aurora recorded—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

2. Aweme, IV ; Bowsman, IV.
3. Haileybury, III ; Aweme, IV ; Bowsman, Melfort, IV.
4. Battleford, IV.
6. Hillview, IV ; Bowsman, IV.
7. Battleford, IV ; Pembina Crossing, IV.
8. Grenfell, Pembina Crossing, IV.
9. Melfort, IV.
10. Bowsman, IV.
11. Grenfell.
15. Moose Jaw, Rat Portage.
16. Picton, IV ; Haileybury, III ; Toronto, IV ; Regina, IV.
17. Minnedosa, III.



MONTHLY and Annual Summaries for the Year 1901, Carmanah, British Columbia—Latitude, N. 48° 37' ;  
Longitude, W. 124° 47'. Height above Sea, 130 feet.

MONTH.	PRESSURE AT 32.			TEMPERATURE.								RELATIVE HUMIDITY				PRESSURE OF VAPOUR.				CLOUD-NESS.				PRECIPITATION.	
	Extremes.			Mean.				Extremes																	
	Monthly Mean.	Max.	Min.	8 a.m.	3 p.m.	8 p.m.	Max.	Min.	Monthly	Max.	Min.	a.m.	p.m.	p.m.	Mean.	a.m.	p.m.	p.m.	Mean.	8 a.m.	3 p.m.	8 p.m.	Mean.	Total.	Maximum in Month.
	in.	in.	in.													in.	in.	in.	in.					in.	in.
January.	29.78	30.36	29.14	38.7	42.4	38.7	44.0	34.5	39.2	50.0	30.0									64.62	63.63			8.19	3.59
February.	29.82	30.14	29.34	40.0	44.4	43.9	46.0	33.6	39.8	56.0	28.0									57.53	55.48			9.25	4.45
March.	29.86	30.39	29.23	43.3	45.0	42.5	48.5	37.0	42.8	52.0	31.0									66.63	54.61			2.94	1.16
April.	29.87	30.30	29.29	43.7	49.0	43.5	51.0	36.2	43.6	58.0	31.0									51.40	49.47			8.33	3.25
May.	29.86	30.28	29.78	49.7	54.1	48.6	56.2	43.5	49.8	70.0	36.0									59.50	46.52			11.34	3.77
June.	29.90	30.16	29.62	51.9	55.5	51.2	57.6	46.0	51.8	69.0	38.0									55.55	63.58			3.48	1.60
July.	29.88	30.04	29.61	54.4	58.0	53.6	59.6	48.2	53.9	62.0	44.0									66.39	37.47			0.80	0.35
August.	29.87	30.05	29.68	56.2	60.8	55.3	63.0	59.4	56.7	76.0	47.0									60.29	52.50			0.08	0.05
September.	29.78	30.11	29.15	53.6	56.8	52.6	58.0	46.2	52.0	67.0	41.0									55.53	52.53			6.10	1.60
October.	29.85	30.32	29.41	55.3	58.9	55.2	60.7	49.8	55.3	65.0	40.0									68.63	56.62			6.84	2.90
November.	29.75	30.20	29.30	48.8	50.4	47.8	51.4	43.2	47.3	60.0	35.0									80.88	94.87			20.68	6.00
December.	29.96	30.34	28.78	42.3	45.4	42.6	46.4	37.5	42.0	52.0	29.0									71.75	67.71			16.08	5.00
Year.	29.85	30.39	28.78	48.2	51.7	47.6	53.7	42.2	47.8	76.0	28.0									63.57	56.59			94.11	6.00

MONTH.	NUMBER OF WINDS FROM										Average Hourly Force.	Maximum Force.	Direction at time of Maximum Force.	No. of Gales.	NUMBER OF DAYS											
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	Clear.					Partly Cloudy.	Cloudy.	Precipitation of in. or over.	Snow.	Hail.	Fair.	Fog.	Thunder Storms.	Lightning Alone.	Aurora.		
January.	11	7	31	11	2	6	19	1	14	III	X	S.W.	13	6	8	17	15	10	0	9	0	0	0	0		
February.	11	9	30	7	8	6	9	0	4	IV	IX	E.	21	11	10	7	9	0	0	18	0	0	0	0		
March.	7	1	36	5	0	4	27	0	13	III	VIII	W.	15	3	13	15	11	0	0	8	1	0	0	0		
April.	3	2	26	19	4	5	29	1	16	III	X	S.	10	9	12	10	13	1	0	12	0	1	0	0		
May.	5	0	27	6	6	2	33	0	11	III	VIII	E.	8	19	11	10	17	0	0	12	3	0	0	0		
June.	0	0	14	7	1	5	40	1	22	II	VII	W.	5	7	11	13	11	0	0	12	3	0	0	0		
July.	0	0	12	6	1	4	34	1	29	II	VI	S.W.	5	10	13	8	5	0	0	22	8	0	0	0		
August.	0	0	8	8	2	1	33	0	33	I	V	E.	1	12	10	9	2	0	0	26	16	0	0	0		
September.	2	0	31	2	1	2	19	0	24	II	VII	E.	8	9	9	8	6	0	0	19	5	0	0	0		
October.	2	0	39	6	3	6	10	0	27	II	IX	S.	7	9	5	14	12	0	0	17	9	2	0	0		
November.	1	3	50	9	0	10	4	1	6	V	X	W.	20	2	5	24	22	0	0	0	1	3	0	0		
December.	7	16	28	11	4	6	11	1	9	IV	X	S.	16	5	7	19	21	2	0	10	1	0	0	0		
Year.	49	38	317	88	32	57	259	6	211	III	X	S.W.	129	93	114	154	141	13	0	165	47	6	0	0		

## JANUARY GALES FROM THE GREAT LAKES TO THE MARITIME PROVINCES.

In treating of the storms which have been experienced in Canada from the Great Lakes to the Maritime Provinces in January from the years 1874 to 1902 inclusive, the writer does not intend to enter to any extent into the question of the why and wherefore of the development of these storms, or to discuss whether or no the course of storms is governed by the anticyclones, or to touch upon other vexed questions which have been from time to time treated upon, but having gained considerable assistance himself in "forecasting," by the tabulation and study of the storms of the different months of the year, he may possibly be able to point out a few salient features which may be of avail to others in practical weather forecasting. As a review of the twelve separate months would necessarily occupy a large amount of space, the Month of January only will be at present considered. In the first place perhaps it will be as well to give a table of the number of low areas charted, the percentage of storms caused by them and the percentage of storms caused by lows from the several directions.

In explanation it should be stated that "North-west Lows" are those originating or moving from the British Columbia Coast and east as far as Manitoba. "West Lows," those from the Pacific Coast States, and West States between latitudes 48 and 35°. "South-west Lows," from Lower California, Mexico, Texas and the Gulf of Mexico. "Atlantic Lows," as designated. "Erratic Lows," developing anywhere from the Lakes east to the Maritime Provinces, including the New England States.

## NUMBER OF LOWS AND THE DIRECTION FROM WHICH THEY CAME

Total Number.	North West.	West.	South-west.	Atlantic.	Erratic.
330	149	61	87	24	9

## TOTAL PERCENTAGE OF AREAS CAUSING GALES, ALSO PERCENTAGE OF GALES FROM AREAS FROM THE SEVERAL DIRECTIONS.

DISTRICT.	Total Number of Gales.	Percentage.	Percentage from North-west.	Percentage from West.	Percentage from South-west.	Percentage from Atlantic.
Lakes	162	49.9	45.0	64.0	54.0	0.0
Lower St. Lawrence and Gulf.	167	50.6	32.2	49.2	65.5	50.0
Maritime Provinces.	176	53.3	29.5	50.8	78.2	75.0

In referring to the tables one is at first struck with the few erratic lows, or abnormal developments, yet on second reflection we realize that were such conditions of frequent occurrence the efficiency reached to-day in scientific weather forecasting could not have been obtained, consequently we learn that normal movements are to be expected, not abnormal, or highly improbable, as we are at times apt to endeavour to persuade ourselves is to be the case.

The percentage of gales caused by North-west lows diminishes rapidly as we proceed eastward. This is instructive, showing as it does that a considerable number of this class of areas decrease in energy as they progress towards the Atlantic. The same conditions hold good as regards the West Lows, but to a lesser extent; a far larger percentage, however, of the West Lows cause storms than do the North-west. This perhaps may in a measure be accounted for by the frequency with which in this class of area the secondary development occurs, without which the primary system does not as a rule retain for long its energy. Referring to the South-west Lows, we find the conditions practically reversed, for the percentage of gales caused by these areas increases rapidly as the eastern portion of the continent is reached. This knowledge is again useful, indicating as it does that a considerable number of these important disturbances do not to any extent affect the Lake Region. When we come to the Atlantic series of areas, that is, those disturbances which either pass up, or far out to sea from the United States Atlantic Coast, towards the Maritime Provinces, it is seen that in the long period herein considered, none of these areas gave a storm in the Lake Region, and further, that a large number moved so far to the southward of Nova Scotia that their influence did not extend as far to the northward as the Gulf of St. Lawrence, suggesting that the gales caused by them are more likely to be backing than veering.

The gales of January have been separated into three classes—those of great violence, the fresh gales, and the moderate storms. Classing the first two together the percentage for the fresh to heavy gales for the districts is as follows:—Lower Lakes, 46·3 per cent; Lower St. Lawrence and Gulf, 65·9; Maritime Provinces, 53·4. Therefore, fresh to heavy gales are more numerous in the Maritime Provinces than in the Lake Region and much more so in the Lower St. Lawrence and Gulf. In the Lake Region the gales of the marked heavy type were 25; less than one for each January. In the Lower St. Lawrence Valley and the Gulf the maximum was reached with 68, whilst in the Maritime Provinces they were 54. The question naturally arises, what is the cause of these violent gales? can any reasons be given for their development and are there any guides to aid one in anticipating these great atmospheric disturbances? In the first place the number of violent gales caused by North-west Lows is few in number, and they appear to be of three types, the low which steadily increases in energy as it drifts eastward, the low immediately succeeded by a great cold wave, and the low which at first travels south-eastward and then suddenly recurs north-eastward. The violent gales from West Lows are even fewer than those from the North-west; a suggestion, however, has been already hinted at elsewhere in this paper regarding this class of area. The South-west Low so frequently shows so much energy from its apparent inception that no doubt exists as to its ultimate destructive character, but if in a seemingly weak area, should two or more foci appear, or should a secondary development set in in the southern part of the system, or on, or near to the United States Atlantic Coast, usually in the vicinity of New Jersey or Connecticut, then a storm of great violence almost invariably ensues. There are not many Atlantic Lows, as will be seen by referring to the table; nearly all, however, bring a gale to the Maritime Provinces although the violent gales caused by them are few in number, doubtless owing to their general course being far to the southward of Nova Scotia. The erratic developments herein considered must not be confounded with the erratic change of the course of a low, from the normal to the abnormal, which from time to time is observed. These peculiar or backward movements of depressions are so rare that they hardly enter into the consideration; however, it would be very interesting to have the opinions of others on the causes of these sporadic movements, especially as there are instances on record, where owing to such conditions, the gale which had seemingly subsided has again set in with greater violence than before.—B. C. WEBBER.

#### CLIMATE OF DAWSON, YUKON.

A somewhat broken series of observations at Dawson and various other places in Yukon Territory between 1895 and 1898 and a continuous series at Dawson during the past three years, afford data for estimating with a fair degree of accuracy the average climatic conditions of the Klondike. The average annual mean temperature is about 22°; the mean of the three summer months is about 57°, July being 61°; and of three winter months —16°, with January —23°. Spring may be said to open towards the end of April, the last zero temperature of the winter usually occurring about the 5th of this month. May, with an average temperature of 44°, is by no means an unpleasant month and the 23rd is the average date of the last frost of Spring. Daily observations during five summers indicate that on the average the temperature rises to 70° or higher on 46 days and to 80° or higher on 14 days; 90° was recorded in Dawson in June, 1899, and 95° in July of the same year. These temperatures with much bright sunshine and an absence of frost during three months together with the long days of a latitude within a few degrees of the Arctic Circle amply account for the success so far achieved by market gardeners near Dawson in growing a large variety of garden produce including lettuce, radish, cabbage, cauliflower and potatoes, and warrant the belief that the hardier cereals might possibly be a successful crop both in parts of Yukon Territory and in the far northern districts of the Mackenzie River Basin. August 23rd would appear to be the average date of the first autumnal frost, the temperature rapidly declining towards the close of this month. Although night frosts are not infrequent in September, the month as a whole is mild with a mean temperature of 42°. October may be fairly termed a winter month, the mean temperature being but 22·5 and the first zero of winter recorded on the average about the 18th. Ice usually begins to run in the Yukon about the second week but it is not until quite the end of the month or early in November that the river is frozen fast. The temperature on the average during a winter falls to 20° below zero or lower on 72 days, to 40° below or lower on 21 days, to 50° below or lower on 7 days, and to 60° below or lower on 2 days. In January, 1896, 65° below was registered at Fort Constantine, and in January, 1901, 68° below was recorded at Dawson.

Observations of rain and snow have until the close of last summer been very fragmentary but it is probable that the summer rainfall near Dawson is usually between seven and nine inches, and that the total snowfall of the Autumn and Winter is between 50 and 60 inches.

Dawson being situated near the river with high hills or mountains on all sides is well protected from the winds and a feature of the town and indeed of the neighboring country is the long periods of calm weather which occur.

## FORECASTS FOR JANUARY, 1902.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1,027. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			Percentage.
		No. Fully.	No. Partly.	No. Not.	
MANITOBA.....	86	77	6	3	93.0
LAKE SUPERIOR.....	91	76	12	3	90.1
LOWER LAKE REGION.....	103	90	9	4	91.7
GEORGIAN BAY.....	103	93	6	4	93.2
OTTAWA VALLEY.....	99	83	10	6	88.9
UPPER ST. LAWRENCE.....	99	86	8	5	90.9
LOWER ST. LAWRENCE.....	97	83	9	5	90.2
GULF.....	109	93	12	4	90.8
MARITIME PROVINCES, WEST.....	120	102	15	3	91.3
MARITIME PROVINCES, EAST.....	120	104	12	4	91.7
TOTAL.....	1,027	887	99	41	91.2

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

The forecasts and storm warnings were issued by Forecast Official, B. C. Webber.

R. F. STUPART,

*Director.*

Meteorological Office, Toronto,  
26th February, 1902.

# METEOROLOGICAL SERVICE, DOMINION OF CANADA.

## Monthly Weather Review.

VOL. XXVI

FEBRUARY, 1902.

No. 2

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### REMARKS UPON THE WEATHER.

In British Columbia the weather was exceedingly mild throughout the greater part of the month, more especially after the 15th, when spring-like conditions prevailed in most districts. Clouded skies were somewhat more frequent than usual, and although the precipitation was light at Victoria and also at a few places in the northern portion of the province, it was heavy elsewhere. In Vancouver Island and over the lower mainland the snow had disappeared by the 4th, and over the upper mainland there was little to be seen on the 28th excepting on the mountains. In the western portion of the province snowdrops, crocus and wallflower were in bloom early in the month.

In the North-west Territories cold weather continued up to and including the 9th, after which there was a marked rise in temperature, and unusually mild weather prevailed to the end of the month. At some places in Alberta the temperature rose to 50° late in the month, and at this time fogs were recorded at many stations. The sky was overcast rather frequently and many light snowfalls occurred. The snow, however, soon melted, and in south-western Alberta, on the last day, the ground was bare in many localities.

The weather conditions in Manitoba were very similar to conditions in the Territories, but the change from cold to milder weather was not so marked, and was from one to two days later: nevertheless, exceptionally high temperatures prevailed more especially after the 17th. In western districts, dull, cloudy weather was unusually frequent, and the total precipitation exceeded the average in most places. Much of the snow that fell was soon melted, and although there was sufficient for sleighing in most localities the ground was bare and cattle were grazing in some portions of the province.

In Ontario, at the close of January, there was a heavy covering of snow over the larger portion of the province, and on February 2 this was augmented by a snowstorm, during which twenty inches fell in the Ottawa Valley and a smaller amount further west. This snowfall was accompanied by violent gales which caused much drifting and blocking of railways and roads. No other heavy fall occurred, and notwithstanding the continuance of steady cold weather until the 20th, the snow was gradually disappearing. From the 21st until the end of the month, unseasonably mild weather prevailed, and by the 28th all fields and open country in the southern and western portions of the province were bare of snow. A heavy rain occurred during the night of the 27th, and the weather then continued showery.

The most marked feature of the month in the Province of Quebec was the heavy snowstorm of the 2nd, during which from sixteen to twenty-four inches of snow fell accompanied by violent gales; a wind velocity of seventy-seven miles per hour was registered at Quebec. Gales also occurred on the 17th and 28th, the former accompanied by a moderate snowfall and the latter by rain.

In New Brunswick, February was a remarkably mild and open month with a marked absence of rain: the heaviest fall of snow occurred with the severe gale of the 2nd, when a wind velocity of eighty-four miles an hour was registered at St. John, the highest on record. Spring-like conditions were general towards the close of the month, and where bare ground had not already been reached, the snow was melting rapidly.

The weather in Nova Scotia was very similar to that in New Brunswick, but it was rather more changeable up to about the 17th. After this date exceedingly mild weather set in and continued so to the end of the month. In Cape Breton the precipitation was heavy, but elsewhere it was generally deficient. Most of the snow which fell during the month was soon melted, and by the 28th the ground was bare in most districts.

In Prince Edward Island the weather was exceedingly mild and dry, and although somewhat dull during the greater part of the month, there were bright days. After the 17th, when the weather became almost springlike, the snow soon disappeared, and the ground was practically bare by the 28th.

### ATMOSPHERIC PRESSURE.

The mean atmospheric pressure was lower than average throughout the Dominion: the smallest negative departure, about five hundredths of an inch, occurred to the northward of Manitoba, whence both westward and eastward the departure increased, Victoria, B.C., showing as much as 0.33 inch below average and stations in Nova Scotia from 0.22 to 0.24 below.

### HIGH AREAS.

Six areas of high pressure were charted during the month, none of them being of any great importance.

No. 1 covered the North-west States and Territories on the 1st. It then travelled to Missouri, where it was joined by No. 2, which had formed over Saskatchewan on the 3rd, and the combined system moved eastward to the Middle Atlantic Coast where it lost its identity. It was attended by very low temperatures in Manitoba and the Territories, temperatures of from 10° below to 28° below zero being recorded. Temperatures below zero were also prevalent in Northern Ontario and Western Quebec. No. 3 hovered over the North-west States and Territories from the 5th until the 12th, when an easterly movement began, and it passed over the Maritime Provinces on the 16th. It caused a continuance of decidedly cold weather in the Territories and Manitoba, and also temperatures below zero in Quebec. No. 4 was centred over the Territories on the 15th, and moved south-eastward to Pennsylvania, reaching there on the 20th; thence it moved north-eastward and over the Gulf of St. Lawrence on the 22nd. It was accompanied by decidedly cold weather in the Territories and Manitoba, but in other portions of Canada moderately cold weather only was experienced during its passage. No. 5 was apparently subsidiary to No. 4, forming over Texas on the 21st, and moving north-eastward and up the Atlantic coast, while moderately cold weather continued in Eastern Canada. No. 6 was situated over Washington Territory on the 22nd, thence moving south-eastward to Missouri where it dispersed during the 24th.

### LOW AREAS.

No. 1. A shallow and extensive low area which covered the Gulf States on the morning of the 1st, during the succeeding thirty-six hours, developed into a most pronounced and violent storm, which, on the second morning, was centred in Pennsylvania, and by night in Maine with the barometer at the centre reading 28.60. Gales of exceptional severity accompanied by heavy snow prevailed between the Ottawa Valley and New Brunswick, and gales with a more moderate snowfall were general in the Lake Region and Nova Scotia. The storm quickly dispersed, as it passed away to the northward of the Gulf of St. Lawrence. After this storm several erratic lows traversed the Lake Region and Maritime Provinces between the 4th and 15th, noteworthy among them being one which between the 5th and 8th apparently backed north-westward from the Atlantic to the Lower St. Lawrence Valley and then passed slowly away towards the eastward. Moderate gales were reported in the Maritime Provinces on the 5th, 6th and 9th, and in the Lake Region on the 7th. No. 2 seems to have originated in the South-west States and moved eastward to the Florida coast, then it curved north-eastward skirting the coast and passed over the Maritime Provinces during the 18th and 19th, the barometer reading 29.00 at the centre of the disturbance. Eastern Canada from the Lakes to the Maritime Provinces came under the influence of this depression, moderate gales occurring in the Lake Region on the 17th, and heavy gales in Quebec and the Maritime Provinces on the same date. Strong winds and moderate gales were also experienced in the Maritime Provinces on the 18th and 20th. No. 3 developed over Colorado on the 18th, travelled southward to Texas during the night of the 18th, and thence north-eastward over the Gulf and Middle Atlantic States and passed far south of Nova Scotia on the 22nd. It had no effect upon Canadian weather beyond causing strong winds and light local gales in the Maritime Provinces on the 22nd. No. 4 formed over Texas, and followed a path nearly parallel to and further north than No. 3, passing much nearer the Coast of Nova Scotia and beyond the range of observation on the 28th. It caused strong winds and moderate gales with heavy rain in the Maritime Provinces during the 26th, and early on the 27th. No. 5 was an area of great intensity which moved into the North Pacific States on the 25th, causing gales and heavy rain in British Columbia on the 25th and 26th. It then took a south-easterly course to Oklahoma, and on the 27th recurved north-eastward, and on the morning of the 28th was centred over Iowa with a minimum barometer reading of 28.68 inches, and was covering the greater portion of the continent. By March 1st it was over Lake Superior. Its accompanying gales were felt as far east as Quebec City on the 27th, and on the 28th it caused heavy gales in the Lower St. Lawrence Valley and Gulf.



## TEMPERATURE.

The mean temperature of the month was decidedly above average over the northern portions of the Dominion and above to a lesser extent in the southern portions, except in the south-western counties of Ontario where it was from one to two degrees below. In the extreme north of Quebec, Ontario, Manitoba, and in the Territories, the positive departures exceeded 12°, and the trend of the isotherms would seem to indicate that this wide difference from average probably extended to the Arctic Ocean.

*The Highest and Lowest temperatures in each Province during February, 1902, were :*

British Columbia,	61.5 on 13th at Clayoquot,	—26.0 on 1st at Princeton.
North-west Territories,	53.8 on 25th at Lethbridge,	—35.8 on 3rd at Saskatoon and Athabasca Landing.
Manitoba,	16.2 on 20th at Minnedosa,	—36.0 on 1th at Bowsman.
Ontario,	57.0 on 28th at Sarnia,	—34.0 on 10th at Savanne.
Quebec,	52.0 on 28th at Brome,	—32.8 on 1st at Chicoutimi.
New Brunswick,	52.2 on 27th at St. Stephen,	—28.0 on 12th at Sussex.
Nova Scotia,	47.2 on 28th at Halifax,	— 5.0 on 12th at Parrsboro'.
Prince Edward Island,	42.8 on 18th at Charlottetown,	— 3.1 on 12th at Summerside.

## PRECIPITATION AND DEPTH OF SNOW.

The rainfall seems to have been somewhat greater than average excepting locally both on Vancouver Island and the Lower Mainland of British Columbia. In the North west Territories the snowfall was above average in nearly all localities, while in Manitoba there was an excess in the more western portions of the province and a small deficiency in the eastern portions. From Manitoba eastward to the Maritime Provinces there was a fairly general deficiency of precipitation, but it was slightly in excess in the Ottawa Valley and in Cape Breton; in the first instance owing to the exceptionally heavy snowstorm of the 2nd, and in the other to a large number of falls of rain or snow at intervals during the month. At the close of the month there was more snow on the ground in the Province of Quebec than at the close of the previous month. Montreal reported 15 inches, Richmond, 36; Quebec, 28, and Father Point, 54 inches; the depth, however, except in this province, was in the Dominion generally less than at the corresponding date last year.

## THICKNESS OF ICE.

North-west Territories and Manitoba.—Medicine Hat, 20 inches; Swift Current, 32; Battleford, 26; Minnedosa, 22; Brandon, 40.

Ontario.—Port Arthur, 24 inches; White River, 20; Parry Sound, 22; Gravenhurst, 22; Southampton, 18; Paris, 20; Port Stanley, 14; Kingston, 13; Hamilton, 21; Orillia, 22; Kinnoumt, 22; Barrie, 27; Midland, 22; Stony Creek, 20; Brantford, 25; Port Hope, 27; Woodstock, 20; Arden, 18; Georgetown, 15; Stratford, 15; Westport, 32; Ursa, 20.

Maritime Provinces.—Chatham, 22 inches; Charlottetown, 7; Murray River, 15; Sydney, 3; Point Escuminac, 22; Parrsboro, 15.

## WINDS.

In British Columbia over the Lower Mainland and Vancouver Island the direction was largely between the north and east; fresh to strong breezes were of frequent occurrence, and the force of a moderate gale was attained on four occasions.

In the North-west Territories and Manitoba the direction was largely variable, but favouring slightly the westerly. The wind mileage was by no means excessive; fresh breezes were fairly numerous, but the force of a strong breeze was seldom reached.

In the Lake Region the general direction slightly favoured the westerly. Fresh to strong breezes occurred on fourteen days, and on five other occasions the force of a gale was experienced.

In the Ottawa and St. Lawrence Valleys and the Gulf no one direction predominated, fresh to strong breezes were numerous, but not more so than usual, and the force of a gale was also recorded on five occasions.

In the Maritime Provinces the westerly direction was most in evidence. Fresh breezes occurred on ten days, strong breezes on five and gales on the 2nd, 5th, 17th, 20th and 26th. The moderate storms on the 5th and 20th were not warned, and a warning issued on the 8th was not justified by subsequent high winds. The warnings for the storms on the 2nd, 17th and 26th were amply verified.

## BRIGHT SUNSHINE.

There was an unusually large proportion of bright sunshine in the Province of Ontario, and a decided deficiency in all the other provinces. The highest percentages of the possible amount recorded were 52, 48 and 46 at Toronto, Woodstock and Barrie respectively, and the lowest were 11 and 16 at Nanaimo and Agassiz, B.C. In Manitoba, Brandon and Winnipeg recorded respectively 35 and 44 per cent., both less than average.





# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, FEBRUARY, 1902.

a. Barometer not reduced to Sea Level. \* Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above Sea Level, in feet.	PRESSURE.			TEMPERATURE.			DIRECTION OF WIND FROM					VELOCITY OF WIND			PRECIPITATION.			No. of Days with 0.1 or more in. of Rain.	No. of Thunderstorms.	No. of Auroras.	No. of Foggy Days.											
				Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Highest.	Lowest.	Date.	Mean daily range.	Mean relative humidity.	Mean amount of Cloud.	No. of days completely clouded.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	C.	Total number of hours.	Mean per hour.	Highest days velocity.	Date and direction from which.	Amount.	Difference from Average.	in. in month.	in. in year.		
<b>ONTARIO—(Continued.)</b>																																			
Rockyview	41 28	80 30	1330	14.5	24.0	-18.0	42.0	14.5	0	24.0	-18.0	42.0	14.5	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Whitby	41 28	80 30	1330	14.5	24.0	-18.0	42.0	14.5	0	24.0	-18.0	42.0	14.5	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Orillia	44 34	79 24	200	17.2	23.8	-17.0	40.8	17.2	0	23.8	-17.0	40.8	17.2	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Coldwater	44 38	79 40	200	17.2	23.8	-17.0	40.8	17.2	0	23.8	-17.0	40.8	17.2	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Beaumont	44 58	79 20	170	16.1	23.7	-13.0	36.7	16.1	0	23.7	-13.0	36.7	16.1	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Gravelhurst	44 54	79 20	170	16.1	23.7	-13.0	36.7	16.1	0	23.7	-13.0	36.7	16.1	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Haliburton	44 54	79 20	170	16.1	23.7	-13.0	36.7	16.1	0	23.7	-13.0	36.7	16.1	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Point Clark	44 54	79 20	170	16.1	23.7	-13.0	36.7	16.1	0	23.7	-13.0	36.7	16.1	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Brampton	43 51	81 44	505	22.3	28.1	-12.0	40.1	22.3	0	28.1	-12.0	40.1	22.3	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
London	42 59	81 13	808	18.6	25.0	-10.0	35.0	18.6	0	25.0	-10.0	35.0	18.6	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Port Stanley	42 49	81 13	502	20.0	26.0	-11.0	37.0	20.0	0	26.0	-11.0	37.0	20.0	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Woodstock	43 8	80 47	950	18.9	25.0	-10.0	35.0	18.9	0	25.0	-10.0	35.0	18.9	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Port Dover	42 47	80 13	655	18.4	24.5	-11.0	35.5	18.4	0	24.5	-11.0	35.5	18.4	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Pelican Island	41 50	82 38	810	19.9	25.0	-10.0	35.0	19.9	0	25.0	-10.0	35.0	19.9	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
St. Mary's	43 15	81 11	1040	12.0	18.0	-12.0	30.0	12.0	0	18.0	-12.0	30.0	12.0	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Biscuiting	43 15	81 11	1040	12.0	18.0	-12.0	30.0	12.0	0	18.0	-12.0	30.0	12.0	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Calvin	43 15	81 11	1040	12.0	18.0	-12.0	30.0	12.0	0	18.0	-12.0	30.0	12.0	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Agincourt	43 47	79 16	160	17.0	23.0	-17.0	40.0	17.0	0	23.0	-17.0	40.0	17.0	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
North Bay	46 34	79 30	303	21.4	27.0	-17.0	44.0	21.4	0	27.0	-17.0	44.0	21.4	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Harold	43 16	79 34	303	21.4	27.0	-17.0	44.0	21.4	0	27.0	-17.0	44.0	21.4	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Port Hope	43 36	78 20	140	19.6	25.0	-10.0	35.0	19.6	0	25.0	-10.0	35.0	19.6	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Kilmont	43 36	78 20	140	19.6	25.0	-10.0	35.0	19.6	0	25.0	-10.0	35.0	19.6	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Cochran Island	43 36	78 20	140	19.6	25.0	-10.0	35.0	19.6	0	25.0	-10.0	35.0	19.6	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Chatham	43 36	78 20	140	19.6	25.0	-10.0	35.0	19.6	0	25.0	-10.0	35.0	19.6	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Dalhousie Mills	43 36	78 20	140	19.6	25.0	-10.0	35.0	19.6	0	25.0	-10.0	35.0	19.6	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Meaford	43 36	78 20	140	19.6	25.0	-10.0	35.0	19.6	0	25.0	-10.0	35.0	19.6	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Listowel	43 41	80 55	185	18.5	24.0	-13.0	37.0	18.5	0	24.0	-13.0	37.0	18.5	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Bruce Mines	43 41	80 55	185	18.5	24.0	-13.0	37.0	18.5	0	24.0	-13.0	37.0	18.5	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Rat Portage	43 41	80 55	185	18.5	24.0	-13.0	37.0	18.5	0	24.0	-13.0	37.0	18.5	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Dunnville	43 41	80 55	185	18.5	24.0	-13.0	37.0	18.5	0	24.0	-13.0	37.0	18.5	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Huron Bay	43 41	80 55	185	18.5	24.0	-13.0	37.0	18.5	0	24.0	-13.0	37.0	18.5	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Sturgeon Falls	43 41	80 55	185	18.5	24.0	-13.0	37.0	18.5	0	24.0	-13.0	37.0	18.5	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
St. Catharines	43 10	79 17	210	19.2	25.0	-10.0	35.0	19.2	0	25.0	-10.0	35.0	19.2	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Bloomfield	43 30	77 21	194	19.4	25.0	-10.0	35.0	19.4	0	25.0	-10.0	35.0	19.4	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
<b>QUEBEC.</b>																																			
Montreal	45 30	73 35	187	17.3	23.8	-13.0	36.8	17.3	0	23.8	-13.0	36.8	17.3	86	6	7	34	172	53	24	31	24	274	52	8	672	17.5	35.8	3 W	3.30	0.31	1.35	15.13	0	4
Richmond	45 30	73 35	187	17.3	23.8	-13.0	36.8</																												

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OBSERVATIONS AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
FEBRUARY, 1902.

STATIONS.	RAINFALL.					SNOWFALL.				Remarks.
	Amount in inches.	No. of Days of or Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month.	Date.	
BRITISH COLUMBIA	in.			in.		in.		in.		
Glacier						52.0	17	6.0	10	
Nas Harbour	1.10	2	23	0.60	17	6.0	3	3.0	3	Very little ice on river.
Port Essington	5.50	16	10	1.00	4	0.9	2	0.6	2	
Capitlan	11.54	16	11	3.45	16	3.0	1	3.0	2	
Goldstream Lake	11.15	22	5	3.05	16	0.5	1	0.5	1	
Caulfields	8.64	20	5	1.22	17	1.5	1	1.5	2	
Kuper Island	10.24	24	4	2.96	16	3.0	1	3.0	2	
Royal Oak	3.94	13	15	1.65	15					
Nanaimo	11.98	21	7	3.62	15-16					
N. W. TERRITORIES—										
Beaver Hills, E.						7.8	6	2.2	18	Chinook 16th to 20th.
Innisdail						8.1	9	2.5	17	
Strathcona	R					9.0	12	3.0	17	
Didsbury						8.0	5	3.0	7	
Combs						11.0	5	4.0	7	
Beaver Hills, N.E.						8.0	9	4.0	18	
Salteaux						4.0	2	2.0	13	
Weyburn	0.30	1	19	0.30	26	27.0	8	8.0	26	
Stirling						12.0	2	12.0	6-7	
Brownhill						2.5	1	2.5	6	
Regina						6.3	9	3.0	13	
Dnt Hills			20			16.5	8	9.0	12	
MANITOBA										
Norquay						10.0	6	4.0	27	
Pembina Crossing	R						12			
Belmont	0.11	1	22	0.11	25		5			
Oakbank	0.20	1	21	0.20	27	3.0	5	3.0	15	
Morden	R		21	R	26	12.0	6	8.0	28	
ONTARIO										
Dutton	R		25	R	27	8.0	2	6.0	2	4th, blizzard.
Providence Bay	0.28	1	22	0.28	28	24.0	5	14.0	7	
Deer Park	0.93	1	24	0.93	28	5.7	3	3.7	2	
Mississauga	0.10	1	22	0.10	23	12.5	5	3.0	1	
Sunshine	0.02	1	15	0.02	28	25.0	12	6.0	7	
Princeton	0.54	1	18	0.54	27	12.0	9	6.0	7-8	Lightning and rain 28th
Warton	0.00	0	20			23.0	8	18.0	3-7	
Cavara	0.78	1	17	0.78	28	6.5	9	4.0	2	
Goderich	0.04	1	21	0.04	28	33.0	6	9.0	2	
Georgetown	0.89	3	13	0.86	28	7.6	12	3.0	2	
Port Burwell	0.34	2	20	0.34	28	12.5	7	6.0	3	
Embsdale	0.45	2	19	0.45	27-28	11.8	9	6.0	3	
Montague	0.67	1	22	0.67	28	12.0	5	4.0	3	
Huntsville	0.25	1	22	0.25	28	10.5	5	5.0	2	
Lansdowne	0.50	1	21	0.50	28	9.5	6	5.0	2	
Aplen	0.88	1	21	0.88	28	11.0	6	6.0	3	
Newburgh	0.82	2	23	0.82	27-28	16.0	3	12.0	12	
Oliver's Ferry	0.60	1	22	0.60	28	14.0	5	4.0	2	
Westminster	1.25	2	23	1.25	27-28	5.0	3	5.0	2-3	
Dalton	0.14	2	22	0.10	23	6.0	5	3.5	1-2	
Walter	0.10	1		0.10	28					
Orangeville	1.20	1	21	1.20	28	7.7	6	3.2	3	
Aurora	0.81	2	22	0.81	27-28	7.9	4	5.0	2	
Kitley	0.50	1	19	0.50	28	23.0	6	3.0	9	
Ursa	1.86	2	17	1.41	28	23.0	9	8.0	2	
Wooda	1.01	1	20	1.01	28	13.0	7	7.0	2-3	
Jermyn	0.75	1	24	0.75	28	9.0	3	9.0	2	
Parnia			21			10.5	7	18.0	3	
Westport	0.30	1	17	0.30	28	12.8	10	5.0	2	
Croydon	0.10	1		0.10	28	28.0		18.0	14	
Wyoming			24			13.0	4	9.0	2	
Emmerson	1.25	1	27	1.25	28	6.0	2	4.0	3	
Scarborough	0.96	3	15	0.93	27-28	5.2	10	2.0	2	
Midland	0.15	1		0.15	28					
Lynedoch			20			9.5	8	5.5	2	
NEW BRUNSWICK										
Pont Escommae	0.44	3	18	0.44	27	24.9	7	12.3	6-7	
NOVA SCOTIA										
Port Morden	1.05	5	18	0.39	26-27	17.5	5	6.0	16	



PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF FEBRUARY, 1902.

## HOURS ENDING

	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria.....			0 00	0 04	0 15	0 23	0 27	0 32	0 33	0 22	0 17	0 16	0 07	0 00		
Nanaimo.....			0 00	0 00	0 06	0 13	0 13	0 14	0 15	0 17	0 16	0 15	0 05	0 00		
Agassiz.....			0 00	0 00	0 01	0 07	0 17	0 23	0 24	0 27	0 26	0 20	0 11	0 06		
Battleford.....			0 04	0 20	0 23	0 31	0 35	0 41	0 42	0 40	0 40	0 14	0 06	0 00		
Indian Head.....			0 00	0 00	0 00	0 18	0 39	0 45	0 45	0 37	0 39	0 33	0 07	0 00		
Brandon.....			0 02	0 20	0 33	0 41	0 49	0 51	0 51	0 48	0 42	0 13	0 00	0 00		
Winnipeg.....			0 00	0 07	0 37	0 54	0 60	0 61	0 64	0 66	0 54	0 39	0 08	0 00		
Durham.....																
Woodstock.....			0 00	0 11	0 86	0 53	0 65	0 64	0 63	0 55	0 49	0 48	0 28	0 02		
Toronto.....			0 00	0 02	0 41	0 57	0 60	0 61	0 65	0 67	0 61	0 52	0 40	0 08		
Lindsay.....			0 00	0 04	0 17	0 40	0 53	0 58	0 60	0 56	0 53	0 40	0 29	0 12		
Barrie.....			0 00	0 15	0 31	0 52	0 60	0 64	0 63	0 54	0 50	0 43	0 19	0 00		
Kingston.....			0 00	0 14	0 30	0 39	0 52	0 55	0 56	0 59	0 47	0 39	0 20	0 00		
Ottawa.....			0 00	0 08	0 28	0 34	0 39	0 41	0 44	0 36	0 40	0 45	0 20	0 00		
Montreal.....			0 00	0 02	0 17	0 27	0 36	0 39	0 40	0 45	0 40	0 30	0 06	0 00		
Fredericton.....			0 10	0 30	0 40	0 41	0 48	0 47	0 44	0 36	0 33	0 21	0 00	0 00		

	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Durham.	Woodstock.	Toronto.	Lindsay.	Barrie.	Kingston.	Ottawa.	Montreal.	Fredericton.
Mean proportion for month (Constant sunshine being 1.)	0 19	0 11	0 16	0 30	0 26	0 35	0 44		0 48	0 52	0 40	0 46	0 41	0 32	0 31	0 33
Difference from average...	0 05	—	0 04	0 17	0 10	0 12	0 01	...	0 18	0 15	0 05	0 16	0 03	0 04	0 10	0 02
Maximum daily amount	0 90	0 75	0 85	0 92	0 65	0 86	0 86		0 92	0 88	0 95	0 90	0 91	0 87	0 87	0 91
Date	22	22	21	23	3	4	3	...	22	19	20	15	19	20	14	14
No. of days completely clouded...	10	20	15	8	11	9	7		4	4	8	5	9	8	11	8

*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

1. Aweme, III ; Pembina Crossing, IV ; Oonikup.
2. Battleford, IV ; Minnedosa, IV.
3. Hillview, III ; Aweme, III ; Guelph, II ; Battleford, IV ; Melfort, III ; Oonikup.
4. Melfort, IV.
5. Qu'Appelle, IV.
6. Moose Jaw, Channel Island, IV.
7. Minnedosa, III ; Moose Jaw, Channel Island, III.
8. Bowsman, III ; Aweme, III ; Pembina Crossing, IV ; Battleford, IV ; Moose Jaw.
9. Port Simpson, IV.
11. Aweme, IV ; Battleford, IV.
12. Port Simpson, IV.
14. Savanne.
24. Savanne.
25. Calvin, I ; Huntsville, III ; Gravenhurst, III ; Port Arthur, III.
26. Gravenhurst, IV.

*Thunder recorded on :—*

9. Alberni.
20. Chilliwack, hail ; Ladner, Vancouver, Garry Point.
21. New Westminster.
25. Alberni.
28. Lindsay, Stratford, Georgetown, Alton.

*First appearance of Spring Birds noted :*

CROWS.—Cayuga, 28th ; Arden, 26th ; Oliver's Ferry, 26th ; Jermyn, 25th ; Lucknow, 24th ; Meaford, 17th ; Erasmus, 26th ; Orillia, 26th ; Owen Sound, 21st ; Croydon, 22nd.

GRAY BIRDS.—Croydon, 23rd.

OWLS.—Bala, 15th.

ROBINS.—Owen Sound, 20th ; Stony Creek, 28th ; Alton, 18th ; Cottam, 26th ; Brome, 27th ; Lansdowne, 21th.

BLACKBIRDS.—Owen Sound, 25th.

HAWKS.—Stony Creek, 25th.

BLUE JAYS.—Midland, 18th.

DUCKS.—Tobacco Plains, 18th.

GEORGETOWN, ONT., reports at the end of the month Snowflakes, Crossbills, Red polls, Brown Creepers, Pee wee, Song sparrows and Hawks.

## FORECASTS FOR FEBRUARY, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1002. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba .....	83	60	16	7	81.9
Lake Superior .....	89	71	15	3	88.2
Lower Lake Region.....	105	94	8	3	93.3
Georgian Bay.....	105	88	12	5	89.5
Ottawa Valley .....	100	83	12	5	89.0
Upper St. Lawrence.....	100	87	8	5	91.0
Lower St. Lawrence .....	102	87	7	8	89.2
Gulf.....	103	80	13	10	84.0
Maritime Provinces, West.....	107	91	8	8	88.8
Maritime Provinces, East.....	108	89	8	11	86.1
Total.....	1002	830	107	65	88.2

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,  
*Director.*

Meteorological Office, Toronto,  
26th March, 1902.



# METEOROLOGICAL SERVICE, DOMINION OF CANADA.

## Monthly Weather Review.

VOL. XXVI

MARCH, 1902.

No. 3

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### REMARKS UPON THE WEATHER.

The weather in British Columbia during March was quite cool, and although it became somewhat milder towards the end of the month the temperature range was small. Temperatures below 32° were of almost daily occurrence over the Upper Mainland, but over the Islands and Lower Mainland they were not often recorded. Up to the 22nd there was much cloudy weather with precipitation, this being more especially the case in the western portion; after this date, however, it turned finer, and vegetation, which had been almost stationary up to this date, showed signs of life. Over the Lower Mainland and Islands many plants were in bloom on the 31st.

In the North-west Territories the weather was comparatively mild during the greater portion of the month: between the 14th and 17th, however, temperatures well below zero accompanied by high winds were general. Frequent falls of snow also occurred in Eastern Assiniboia after the 17th, and from that date to the 31st the sky was mostly overcast. In Alberta there was more bright sunshine than elsewhere, and everywhere there was some growth in vegetation.

During the first half of the month the weather in Manitoba was generally fine, but from the 14th to 17th a most severe blizzard was general in this Province. During the 15th and 16th the wind was very high, the velocity exceeding sixty miles for many hours in Winnipeg, and in eastern districts there was a heavy snowfall. In the western portion of the Province the snowfall was not so heavy, but the temperature was lower. On and after the 20th the weather was quite mild, and rivers flooding, the arrival of migratory birds, also other signs of spring were noted.

The exceptionally mild weather in Ontario which set in late in February continued almost uninterruptedly to the end of March; on or about the 4th, also 17th and 18th, cold weather occurred, but these were exceptional days. Clouded skies with light falls of snow or rain were rather frequent, more especially during the last four days of the month when heavy rain occurred in most districts. Thunder was noted on or about the 11th. Early in the month the snow disappeared from the open country, and frequent high winds soon dried the land. The arrival of migratory birds, the cultivation of the land and sowing of grain, also other signs of spring were exceptionally early.

In the Province of Quebec, with the exception of some low temperatures from about the 5th to 10th, the weather was quite mild. Clouded skies with rain or snow were unusually frequent. On the 31st there was little snow upon the ground, and there were many signs of an early spring.

The weather in New Brunswick, although exceedingly dull, was unusually mild, the only exception to these conditions occurring about the 6th to 9th, when temperatures below zero were recorded at many places. Much rain fell during the month, more especially from the 18th to 25th, when heavy falls occurred almost daily. In most places in the open country the ground was bare early in the month, and after the 15th rivers opened, migratory birds arrived, and there were many signs of spring.

In Nova Scotia the weather continued mild almost without interruption, the only low temperatures occurring on the 7th, 8th and 9th. At Halifax rain fell on fourteen days, and generally throughout the Province dull weather with rain was unusually frequent. South-west gales occurred on the 3rd and 6th, and a heavy easterly gale was general on the 19th. The spring-like conditions which prevailed were exceptionally early, migratory birds arriving at many places two weeks earlier than usual.

In Prince Edward Island the weather conditions were similar to conditions in New Brunswick, exceptionally mild weather being general throughout the month, low temperatures only being recorded on the 7th, 8th and 9th. Navigation opened on the 20th, the harbour at Charlottetown being free of ice on the 18th, which is exceedingly early. On or about the 28th the ground was bare and the spring-like conditions prevailing were two weeks earlier than usual.—F. F. PAYNE.

#### ATMOSPHERIC PRESSURE.

The mean pressure of the month was below average from the British Columbia Coast to the western portion of the Province of Quebec, and above average in Eastern Quebec and the Maritime Provinces. An excess of a tenth of an inch was recorded in the Gulf of St. Lawrence and over Cape Breton, and a deficiency of about an equal amount in Manitoba and the eastern parts of the North-west Territories.

#### HIGH AREAS.

Six areas of high pressure were charted during the month, No. 5 being especially noticeable both for its course and persistency.

No. 1 covered the western and north-western part of the Continent on the 3rd, and then drew slowly southward and eastward, passing off the Carolina Coast on the 7th. It was attended in Canada by fine weather and no very low temperatures. No. 2 appeared in Northern Alberta on the 5th, and passing over Canada it reached the Nova Scotian Coast on the 9th. During its presence the temperature in northern localities fell near to or below zero. No. 3 was a very moderate area which was situated in Southern California on the 7th, and after travelling in an almost due easterly course it passed off the Middle Atlantic Coast on the 11th. No. 4 moved into the Middle Pacific States between the 10th and 12th, travelled south-eastward to Texas, and then during the 13th changed its course to north-eastward, reached the Ottawa Valley early on the 14th, and subsequently passed off the New England Coast. It was attended by fine, pleasant weather from Ontario to the Maritime Provinces with very little frost. No. 5 transpired to be the most important area of the month. From the 13th until the 16th it hovered over the North-west Territories accompanied by very cold weather up to the 17th. By the morning of the 18th its centre had passed southward to Missouri whence it was transferred northward again, and from the 20th until the 24th remained almost stationary near the north-eastern end of Lake Superior. Between the 25th and 26th it traversed the Ottawa and St. Lawrence Valleys, and then drew away southward and moved off the United States Atlantic Coast. Cold weather spread into Ontario and Quebec as the system approached, but after the 20th it turned very mild, and a period of unusually mild and fine weather ensued, lasting until within two or three days of the close of the month. No. 6 appeared on the United States North Pacific Coast on the 26th, and afterwards moving very slowly it passed over British Columbia between the 28th and 29th, and on the 30th and 31st lay over Alberta and Western Assiniboia accompanied by quite cold weather, frosts being general even on Vancouver Island.

#### LOW AREAS.

Thirteen areas of low pressure were charted during the month, rather more than the average number for March. There were, besides these, several minor depressions whose paths were too erratic to admit of their being accurately traced.

No. 1 formed near the Texas Coast of the Gulf of Mexico on the 1st, and travelled rapidly east-north-eastward, reaching Maryland on the morning of the 2nd, North-eastern New York the same night, and the St. Lawrence Valley on the morning of the 3rd. It became a very important disturbance and caused a fresh to heavy gale throughout Eastern Canada together with heavy rains in Quebec and the Maritime Provinces. No. 2 first appeared in Northern British Columbia on the 1st, then moving south-eastward: after passing over Arkansas during the night of the 3rd, its course was changed to the eastward, and when near the Virginia Coast on the 5th it was changed to the north-eastward, and on the 6th, the area, now very pronounced, swept over the Maritime Provinces attended by a fresh gale and a considerable quantity of snow and rain. No. 3 was apparently situated on the morning of the 6th in Arizona and its neighbourhood. It travelled as a feeble area to the Lower Lake Region, but arriving on the New England Coast it became more energetic, especially on the morning of the 10th, when off the south-west coast of Nova Scotia, but during the day it seems to have completely dispersed. During its presence between the 8th and 9th there was snow and rain in Ontario and a moderate snowfall in Quebec. In the Maritime Provinces, between the 9th and 10th, there was fairly heavy snow and rain, the wind at the same time increasing to moderate gales in some localities. Nos. 4, 5 and 6 appear to have all belonged to the same system: No. 4 moved into British Columbia on the 5th from the Pacific, and at first it was of considerable energy: after crossing the Mountain Ranges it became much less important, and on the 10th disappeared out of range of observation to the eastward of Manitoba. No. 5 was a shallow area situated in Kansas on the morning of the 10th, and on the evening of the 11th united with No. 6,

another shallow area which, between this date and the 9th, had travelled from Alberta to the Lake Superior District. The system broke up on the 12th over the Georgian Bay Region. Rain was frequent in British Columbia between the 5th and 10th, and there were numerous light snowfalls or flurries in the North-west, while from the lakes to the Atlantic between the 11th and 12th showers were widely experienced. No. 7 was situated in Northern Texas on the morning of the 11th, and thence travelled with great rapidity over the Lower Lake Region and south of Montreal and across the Maritime Provinces. It was not a very important disturbance, but attended from Ontario to the Maritime Provinces by widespread showers, the rainfall being decidedly heavy in many northern localities. The winds on the Lakes and in the St. Lawrence Valleys increased at the same time to strong breezes and moderate gales. No. 8 was situated in Northern British Columbia on the morning of the 12th, and by the following morning had reached the Qu'Appelle Valley. Its centre was then transferred southward, and on the morning of the 14th it was centred in Colorado as a very energetic disturbance. It then recurved north-eastward, and, moving slowly, arrived in Northern Minnesota on the evening of the 15th. Afterwards with diminishing energy it travelled quickly eastward, eventually breaking up on the 18th in Northern New Brunswick. The area was remarkable for its erratic course when in the western portion of the Continent as well as for the great blizzard which it occasioned in Manitoba. In Ontario, Quebec and the Maritime Provinces it was attended by general rains, the winds at the same time increasing to strong breezes and moderate local gales. No. 9 was first indicated off the Carolinas on the 17th, and afterwards until the 25th, a disturbance hovered off our Atlantic Coast, causing for this long period a continuance of very unsettled conditions in the Maritime Provinces with frequent rain, sleet and snow. On the 19th and 20th a fresh gale prevailed and at other times strong breezes were the rule. No. 10 appeared over Nevada and its neighbourhood on the 18th, and travelling over the States adjoining the North Shore of the Gulf of Mexico it passed into the Atlantic and did not affect Canadian weather. No. 11 was centred in Nevada on the morning of the 23rd, and after reaching Colorado early on the 25th it moved northward, passing over Manitoba and out of the range of observation. Between the 25th and 27th it caused rain throughout Manitoba and snow or rain in the greater part of the Territories, the rainfall being considerable in all portions of Manitoba. No. 12 travelled from Texas to the Maritime Provinces between the 27th and 30th, and then dispersed. It brought heavy rains in Ontario, Quebec and the Maritime Provinces, together with strong breezes and moderate local gales. No. 13 followed quickly in the wake of No. 12. It was, however, a more energetic area than its predecessor, and when in the Lower Lake Region on the night of the 30th, its centre shifted southward again from Lake Huron to Lake Erie. During the 31st, however, it assumed the normal course and eventually passed into the Gulf of St. Lawrence. It caused a continuance of the unsettled weather from the Lakes to the Atlantic, snow or rain being generally recorded together with gales in the Lake Region and the St. Lawrence Valley.

#### WINDS.

In British Columbia, on Vancouver Island, and the Lower Mainland, the direction was largely variable, but if anything favouring somewhat the north and east. Gales were experienced on the 3rd, 12th and 26th, and fresh or strong breezes on sixteen days besides.

In the North-west Territories the westerly direction was the most in evidence: the heaviest general gale of the month occurred between the 27th and 29th, and fresh to strong breezes were of frequent occurrence.

In Manitoba the direction favoured the westerly on fifteen and easterly on ten days. Fresh to strong breezes were of frequent occurrence, but the feature of the month was the unusually heavy gale which prevailed uninterruptedly on the 14th, 15th and 16th.

In the Lake Region, the Ottawa and Upper St. Lawrence Valleys, the direction was most often between north and west, fresh to strong breezes were of frequent occurrence and the force of a gale was attained on three or four occasions. In the Lower St. Lawrence Valley and the Gulf the direction was chiefly westerly and easterly; five gales were recorded, and on twenty days there were fresh or strong breezes.

In the Maritime Provinces the direction was variable with many days of fresh or strong breezes. On the 2nd, 6th and 19th fresh gales prevailed generally, while on the 10th, 16th and 29th the force of a moderate gale was locally attained. Signals were displayed for the three general storms, but no warnings were sent for the moderate local gales, and a cautionary warning issued on the 12th to stations in the Bay of Fundy was not justified by subsequent moderate gales.

#### TEMPERATURE.

The mean temperature was higher than average throughout the Dominion, except in the northern parts of British Columbia and Alberta, where it was below. A positive departure of 6° in the central part of the North-west Territories increased eastward to 10° at Winnipeg, and apparently to a larger amount in the extreme northern parts of Ontario and Quebec. In Ontario, south of the Georgian Bay, in the St. Lawrence Valley,

and in the Maritime Provinces the positive departure was from 7 to 10. At Dawson, Yukon, the mean of the month was  $-8.1$  which is probably about 12 below average.

*The Highest and Lowest temperatures in each Province during March, 1902, were:*

British Columbia,	74.0 on 12th at Quesnelle,	$-39.0$ on 15th at Stuart's Lake.
North-west Territories,	59.5 on 13th at Athabasca Landing,	$-36.7$ on 16th at Athabasca Landing.
Manitoba,	59.5 on 25th at Stony Mountain,	$-31.0$ on 17th at Bowsman.
Ontario,	69.0 on 27th at Sarnia,	$-24.0$ on 18th at Savanne and White River.
Quebec,	63.0 on 28th at Richmond,	$-11.6$ on 8th at Chicoutimi.
New Brunswick,	65.0 on 14th at Moncton,	$-12.0$ on 9th at Chatham.
Nova Scotia,	57.5 on 18th at Pictou,	3.0 on 7th at Parrsboro'.
Prince Edward Island,	52.7 on 21st at Charlottetown,	4.1 on 9th at Charlottetown.

#### BRIGHT SUNSHINE.

The percentage of bright sunshine recorded was less than average in all parts of the Dominion except in portions of Western and Northern Ontario, where, as indicated by the Woodstock and Barrie reports, there was a small excess. The highest amounts reported were 39 per cent of the possible at Winnipeg and 37 per cent at Battleford, Woodstock and Ottawa; and the smallest amounts were 18 per cent at Agassiz, B.C., and 25 per cent at Fredericton, N.B.

#### PRECIPITATION AND DEPTH OF SNOW.

The precipitation was largely in excess of average in Quebec and the Maritime Provinces, where it was for the most part rain; also in Western Manitoba and Eastern Assiniboia, where it was for the most part snow. The only pronounced deficiency occurred in Alberta: in other parts of the Dominion, not named above, departures from average were small. At the close of the month the eastern portions of Saskatchewan and Assiniboia and the larger portion of Manitoba were covered with recently fallen snow which would quickly disappear. Eastern Quebec was still snow covered, as much as twelve inches being reported from Father Point. Elsewhere in the Dominion the ground was bare, and in the more southern districts the frost was out of the ground.



# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, MARCH, 1902.

a. Barometer not reduced to Sea Level. • Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above Sea Level, in feet.	PRESSURE.		TEMPERATURE.		Mean temperature of month.	Mean relative humidity.	Mean amount of cloud.	DIRECTION OF WIND FROM						VELOCITY OF WIND.		PRECIPITATION.		Days with rain or more.	No. of fair days.	No. of storms.	No. of fogs.									
				Mean reduced.	Range.	Mean.	Difference from average.	Years observed.	Highest.	Date.	Lowest.	Date.	Mean daily range.	N.	N. E.	E.	S. E.	S.	W.	W. W.	N. W.	C.	Total number of hours.	Mean miles per hour.	Highest day's velocity.	Date and direction from.	Amount.	Difference from average.	Heaviest fall in month.				
<b>BRITISH COLUMBIA:</b>																																	
Victoria.....	48 23 13	123 19	136	29.92	30.51	29.32	1.19	18	43.0	31	30.2	31	30.2	137	79	111	61	15	126	151	31	13	744	9.6	17.6	25 SW	1.25	-0.65	0.66	19	10	0	0
Esquimalt.....	48 23 13	123 19	136	29.92	30.51	29.32	1.19	18	43.0	31	30.2	31	30.2	137	79	111	61	15	126	151	31	13	744	9.6	17.6	25 SW	1.25	-0.65	0.66	19	10	0	0
Port Simpson.....	54 34 13	126 26	770	29.72	30.47	29.12	0.35	18	40.5	31	28.6	31	28.6	8	5	6	8	1	5	6	1	25	62	37.3	36 S	8.47	2.67	0.94	21	16	0	0	
Spence's Bridge.....	54 34 13	126 26	770	29.72	30.47	29.12	0.35	18	40.5	31	28.6	31	28.6	8	5	6	8	1	5	6	1	25	62	37.3	36 S	8.47	2.67	0.94	21	16	0	0	
Revelstoke.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Kimberley.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Pilot Bay.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1	2	2	0	29	62	13.0	12 S	0.28	-0.15	0.16	5	25	0	0	
Port Hope.....	50 0 15	118 46	1180	29.81	30.44	29.28	0.14	18	39.7	31	28.6	31	28.6	0	0	7	15	1															

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, MARCH, 1902.

*m.* barometer not reduced to sea level. \* Stations not furnished with registering thermometers.

[illegible]

[illegible]

QUESTIONS:

# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, MARCH, 1902.

a Barometer not reduced to sea level. \* Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above sea level, in feet.	PRESSURE.			TEMPERATURE.			DIRECTION OF WIND FROM					VELOCITY OF WIND					PRECIPITATION.					No. of Thunder storms.	No. of Fair days	No. of Auroras	No. of Fogs.				
				Mean reduced.	Highest.	Lowest.	Date.	Mean daily range.	Mean relative humidity.	Mean amount of cloud.	No. of days complete.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Total number of hours.	Mean miles per hour.	Highest velocity.	Date and direction from.	Amount.	Difference from average.	Heaviest fall in month.						
<b>NEW BRUNSWICK.</b>																																
Fredericton	45 37	65 26	164	29.97	30.64	29.14	1.50	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Chatham	45 37	65 26	164	29.97	30.64	29.14	1.50	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Grand Manan	44 47	64 16	49	29.92	30.57	29.26	1.31	35.0	9.0	29.51	63	17	3	21	8	31	2	14	9	9	8	62	11.3	17.8	11.97	4.61	1.89	20	10	0	0	6
Point Lepreau	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Halifax	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. Stephen	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Norwich	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Moncton	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Shedden	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
<b>NOVA SCOTIA.</b>																																
Halifax	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Sydney	45 32	63 12	73	29.94	30.64	29.37	1.27	35.0	9.0	29.51	63	17	3	21	8	31	2	14	9	9	8	62	11.3	17.8	11.97	4.61	1.89	20	10	0	0	6
Yarmouth	43 52	63 12	65	29.93	30.67	29.34	1.53	38.2	9.2	29.61	72	14	18	51	26	110	12	97	30	96	11	744	12.4	31.0	10.25	5.83	2.91	17	11	0	0	8
Antigonish	45 42	62 41	170	29.74	30.42	29.11	1.81	36.0	9.0	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Whitehead	45 42	62 41	170	29.74	30.42	29.11	1.81	36.0	9.0	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	45 11	64 52	70	29.98	30.67	29.29	1.38	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Sable Island, P. R.	43 55	59 46	25	29.95	30.63	29.38	1.25	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Sable Island, M. station	43 55	59 46	25	29.95	30.63	29.38	1.25	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Parrish	43 55	59 46	25	29.95	30.63	29.38	1.25	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Wellville	43 55	59 46	25	29.95	30.63	29.38	1.25	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Bridgeville	43 55	59 46	25	29.95	30.63	29.38	1.25	35.1	9.1	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
<b>P. E. ISLANDS.</b>																																
Charlottetown	46 11	63 10	38	29.96	30.62	29.25	1.37	35.2	9.2	29.57	62	17	24	207	24	131	66	136	5	80	71	734	10.2	30.86	3.15	0.03	0.71	15	13	0	0	1
Summerside	46 18	63 31	40	29.97	30.63	29.26	1.37	35.2	9.2	29.57	62	17	24	207	24	131	66	136	5	80	71	734	10.2	30.86	3.15	0.03	0.71	15	13	0	0	1
Hamilton	46 23	63 45	40	29.97	30.63	29.26	1.37	35.2	9.2	29.57	62	17	24	207	24	131	66	136	5	80	71	734	10.2	30.86	3.15	0.03	0.71	15	13	0	0	1
<b>NEWFOUNDLAND.</b>																																
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
Charlottetown	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13	3	20	13	93	7.8	17 4 15 SW	7.58	3.70	1.81	19	12	0	0	7
St. John's	47 31	52 42	125	29.91	30.41	29.32	1.12	34.5	8.5	29.56	64	18	4	22	7	30	1	13														

OBSERVATIONS AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
MARCH, 1902.

STATIONS.	RAINFALL.					SNOWFALL.				Remarks.
	Amount in inches.	No. of Days 01 or Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month.	Date.	
BRITISH COLUMBIA—	in.			in.		in.		in.		
Goldstream Lake.....	6.40	25	6	1.15	4	7.0	2	4.0	14	
Kuper Island.....	3.01	16	15	0.64	4	1.0	2	1.0	14	
Royal Oak.....	3.43	17	13	0.65	4	"	1	"	14	
Nanaimo (City).....	3.64	11	20	1.20	3	0.1	1	0.1	14	
Caulfields.....	7.47	21	8	0.94	4	1.0	1	1.0	16	
Couquitlam.....	8.86	15	16	1.35	26					
Nasas Harbour.....	5.04	14	17	1.45	20	26.0	6	12.0	18	Thunder storm 25th.
Port Essington.....	10.54	25	6	1.62	12	1.7	6	0.6	17	
N. W. TERRITORIES—										
Broomhill.....						5.7	5	2.0	14	
Beaver Hills, N.E.....						3.5	4	2.3	22	Gales 12th, 13th and 28th
Immisfail.....						1.3	7	0.5	27	
Regina.....	0.31	7	19	0.15	24	3.0	9	2.0	20	Fog 13th, 23rd, 26th.
Weyburn.....	0.95	3	17	0.60	26	19.0	10	3.0	6	15th, 16th, blizzard.
Diet Hills.....						2.0	4	1.0	24	Fog 22nd, 24th, 25th, 26th.
Salcoats.....	1.10	2	27	0.60	29	6.0	2	4.0	27	
Didsbury.....						0.5	1	0.5	27	
Combs.....						8.2	5	3.0	14	28th, snow all gone.
Beaver Hills, E.....						5.3	5	2.0	21	Fog 20th, 21st.
MANITOBA—										
Norquay.....	1.90	7	15	0.56	26	7.0	10	2.0	21	14th to 16th, worst blizzard in 19 years.
Morden.....	0.80	4		0.32	23					15th, 16th, blizzard.
Belmont.....	2.70	6	19	1.67	26		4			
Moreton.....	1.81	4	18	1.10	26	10.0	9	2.5	21	14th to 16th, very bad bliz- zard for 60 hours
ONTARIO—										
Lynedoch.....	1.48	3	28	1.24	26					
Newburgh.....	2.66	8	21	0.83	16	1.0	2	1.0	9	
Deer Park.....	2.21	8	22	1.31	29	1.7	3	1.0	9	Thunder storm 12th.
Ursa.....	4.33	8	22	1.25	12	1.0	1	1.0	8	" 12th.
Orangeville.....	1.59	5	24	0.98	12	4.8	2	2.8	9	
Oliver's Ferry.....	1.78	5	24	0.50	13	2.0	2	1.0	8	Snow all gone on 24th.
Dutton.....	1.78	6	23	1.28	28		2			
Ennismore.....	1.45	3	27	1.00	22	1.0	1	1.0	9	
Parma.....	2.77	5	26	0.64	12					
Montague.....	3.01	4	26	0.94	12	2.0	1	2.0	9	
Scarborough.....	2.26	9	16	1.29	28	2.7	6	2.5	8	Thunder storm 12th.
Wartford.....	2.61	6		1.00	28					
Wooler.....	2.34	8	20	0.99	28		3			
Jernyn.....	2.30	2	29	1.30	29					
Arden.....	3.59	10	20	0.79	1	1.0	1	1.0	9	23rd, snow gone.
Midland.....	3.22	5	24	1.15	28	0.7	2	0.5	17	
Cayuga.....	1.50	5	19	0.90	28		3			
Lansdowne.....	0.95	2	28	0.50	1	0.5	1	0.5	18	Lightning 1st; thunder storm 12th.
Ennisdale.....	3.75	10	18	1.04	12	3.5	5	2.0	13	
Aurora.....	1.74	9	20	0.58	28	2.5	2	1.3	1	Thunder storm 11th.
Goderich.....	1.50	4	27	0.50	28					
Westminster.....	2.68	5	25	1.71	28		1			
Mississauga.....	0.10	1	26	0.10	1	9.0	5	3.0	10	
Lion's Head.....	4.86	6		2.80	12					" 11th.
Warton.....	3.47	6	23	1.20	12	3.0	2	2.0	18	" 11th.
Deatown.....	3.59	12	19	1.51	28					
Princeton.....	2.71	5	22	1.50	28	3.5	4	1.5	8	" 10th.
Sunshine.....	2.52	8	19	0.89	28	2.5	3	1.0	9	" 11th.
Port Burwell.....	2.50	9	21	1.20	28	0.3	1	0.3	30	" 13th.
Huntsville.....	3.88	7	21	0.90	16	3.0	3	2.0	13	
Westport.....	4.11	12	19	1.0	9	0.4	2	0.3	9	Thunder 12th, 21st.
Wyoming.....	2.40	6	23	0.85	29		2			Thunder storm 12th.
Georgetown.....	1.78	10	16	0.76	29	6.1	8	2.8	8	" 11th, 12th.
Croydon.....	2.55	6	24	0.80	29		1			
Providence Bay.....	1.55	6	23	0.65	11	3.0	2	2.0	31	" 11th.
NEW BRUNSWICK—										
Point Escominac.....	2.71	9	17	1.47	18	19.6	5	9.3	6	
NOVA SCOTIA—										
Port Morien.....	3.13	8	21	1.42	31	4.5	3	4.0	11	

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF MARCH, 1902.

	Hours Ending															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria			0 05	0 27	0 31	0 40	0 40	0 41	0 35	0 37	0 39	0 37	0 32	0 11		
Nanaimo			0 11	0 28	0 30	0 41	0 38	0 38	0 32	0 36	0 37	0 34	0 32	0 10		
Agassiz			0 00	0 04	0 21	0 29	0 29	0 32	0 30	0 25	0 22	0 04	0 00	0 00		
Battleford	0 06	0 21	0 32	0 34	0 37	0 41	0 41	0 44	0 45	0 46	0 45	0 36	0 08			
Indian Head			0 00	0 05	0 23	0 33	0 37	0 36	0 36	0 32	0 23	0 19	0 04	0 00		
Brandon			0 02	0 10	0 36	0 44	0 45	0 45	0 45	0 44	0 41	0 25	0 04	0 00		
Winnipeg			0 02	0 26	0 30	0 47	0 50	0 50	0 57	0 60	0 57	0 45	0 31	0 05		
Woodstock			0 00	0 26	0 37	0 44	0 47	0 46	0 45	0 53	0 54	0 48	0 41	0 05		
Toronto			0 02	0 27	0 36	0 39	0 39	0 42	0 47	0 45	0 39	0 44	0 45	0 28		
Lindsay			0 10	0 26	0 32	0 41	0 40	0 42	0 39	0 39	0 39	0 36	0 33	0 28	0 10	
Barrie			0 11	0 34	0 36	0 43	0 45	0 50	0 49	0 48	0 43	0 47	0 46	0 26	T	...
Kingston			0 03	0 39	0 44	0 41	0 37	0 39	0 40	0 36	0 37	0 33	0 29	0 10		
Ottawa			0 05	0 28	0 40	0 43	0 46	0 48	0 52	0 47	0 45	0 44	0 34	0 08		
Montreal			8	0 23	0 33	0 38	0 39	0 36	0 42	0 36	0 36	0 38	0 27	0 02		
Fredericton			0 07	0 19	0 30	0 27	0 26	0 29	0 31	0 34	0 32	0 31	0 25	0 08		...
Mean proportion for month	0 31	0 31	0 18	0 37	0 21	0 29	0 39	0 37	0 36	0 35	0 40	0 32	0 37	0 34	0 25	
<i>Constant, consistent, mean</i>																
Difference from average	0 07		0 06	0 11	0 14	0 15	0 12	0 03	0 06	0 09	0 02	0 11	0 01	0 07	0 16	
Maximum daily amount	0 82	0 90	0 71	0 98	0 71	0 75	0 90	0 80	0 90	0 98	0 95	0 50	0 88	0 95	0 92	
Date	29	27	2	18	9	1	4	25	25	23	14	14	14	10	25	14
No. of days completely clouded	7	4	12	10	13	15	11	7	6	10	4	11	6	15	11	

*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

2. Melfort, IV.
3. Savanne.
4. Pembina Crossing, IV : Bowsman, IV : Haileybury, IV.
5. Haileybury, IV.
8. Aweme, IV : Hillview, IV : Bowsman, IV : Grenfell.
10. Swift Current, I : Pembina Crossing, IV : Rat Portage, IV : Aweme, III.
11. Savanne, Aweme, II : Hillview, IV : Oakbank, Estevan, III.
12. Minnedosa, II : Port Arthur, II : Melfort, IV.
24. Father Point, III : Chicoutimi : Haileybury, IV.
31. Swift Current, IV.

*Thunder recorded on :—*

1. Port Stanley.
2. Quebec.
3. Port Bobs.
5. Port Bobs.
10. Beaver Hills, W. Princeton, Point Clark.
11. London, Gravenhurst, Parry Sound, Toronto, Meaford, Providence Bay, Lion's Head, Wiarton, Sunshine, Georgetown, Agincourt, Lucknow, Peterboro'.
12. Chilliwack, Stratford, Port Arthur, Deer Park, Ursa, Scarboro, Sunshine, Georgetown, Erasmus Clontarf, Haliburton, Point Clark, Lucknow, N. Nicomen.
13. Port Stanley, Port Burwell, Westport, Kinmount.
21. Westport.
25. Naas Harbour.
26. Port Simpson, Point Clark, Oakbank, Pembina Crossing.
28. Bridgetown.
30. Dunnville.
31. Windsor.

*Appearance of Spring Birds, &c. :—*

MEADOW LARKS.—Nanaimo, 9th : Pembina Crossing, 30th : Scarboro, 20th : Agincourt, 18th : Stony Creek, 12th : Princeton, 16th.

BLUE BIRDS.—London, 16th : St. Stephen, 22nd : Tobacco Plains, 30th : Brome, 24th : Dutton, 6th : Scarboro, 16th : Erasmus, 13th : Ridgetown, 9th : Lucknow, 11th : N. Nicomen, 9th : Princeton, 31st : Georgetown, 6th : Stony Creek, 10th.

GRAY BIRDS.—London, 16th : Agincourt, 14th.

ROBINS.—Lakefield, 14th : Gray Hill, 27th : Alberni, 5th : Cranbrook, 20th : N. Nicomen, 10th : Princeton, 9th : Barrie, 21st : Kinmount, 2nd : Georgetown, 6th : Stony Creek, 10th : Gravenhurst, 20th : Meaford, 14th : Tobacco Plains, 10th : Kuper Island, 3rd : Innisfail, 28th : Erasmus, 15th : Hamilton, 13th : Dunnville, 10th : Bruce Mines, 22nd : Agincourt, 11th : Brantford, 9th : Pembina Crossing, 25th : Ursa, 14th : Dutton, 10th : Montague, 12th : Scarboro, 8th : Arden, 16th : Clontarf, 18th : Collingwood, 10th : Ridgetown, Orillia, 17th : Beatrice, 22nd : Welland, 10th : Peterboro', 14th : Midland, 14th : Cayuga, 8th : Emsdale, 16th : Dealtown, 1th : Princeton, 5th : Huntsville, 23rd.

GULLS.—Gravenhurst, 16th : Bruce Mines, 26th.

WILD DUCKS.—Beaver Hills (N.E.), 26th; Innisfail, 31st; Coutts, 11th; Norquay, 26th; Stony Creek, 8th; Abitibi, 30th.

BLACK BIRDS.—Meaford, 21st; Pembina Crossing, 31st; Dutton, 14th; Montague, 12th; Scarboro, 26th; Arden, 15th; Erasmus, 15th; Paris, 8th; Dunnville, 25th; Haliburton, 15th; Ridgetown, 11th; Lucknow, 18th; Brantford, 13th; Peterboro', 16th; Lakefield, 16th; Kilmount, 4th; Georgetown, 14th; Paris, 8th.

SONG SPARROWS.—Meaford, 11th; St. Stephen, 28th; Dutton 7th; Haliburton, 13th.

WILD GEENSE.—Summerside, 1st; Portage la Prairie, 13th; Coutts, 11th; Norquay, 10th; Pembina Crossing, 13th; Dutton 12th; Montague, 11th; Midland, 2nd; Princeton, 16th; Wyoming, 21st; Alton, 11th; Welland, 6th; Lakefield, 15th; Estevan, 21st.

PINE SISKIN.—St. Stephen, 8th.

HORNED SPARROW.—Crescent Lake, 10th.

CROWS.—Brone, 5th; Pembina Crossing, 8th; Bruce Mines, 12th; Clontarf, Ridgetown, 11th; Kilmount, 1st; Beatrice, 3rd; Point Clark, 1st; Whiteside, 7th; Savanne, 12th; Lakefield, 7th; Estevan, 22nd; Princeton, 11th; Abitibi, 12th.

FROGS.—Nanaimo, 1st; Chilliwack, 2nd; Stratford, 22nd; Kingston, 27th; Meaford, 23rd; Brone, 28th; Dutton, 22nd; Erasmus, 25th; Alton, 20th; Lucknow, 12th; Stony Creek, 16th; Brantford, 11th; Welland, 15th.

#### FORECASTS FOR MARCH, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1003. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba, . . . . .	87	71	9	7	86.8
Lake Superior, . . . . .	95	72	11	12	81.6
Lower Lake Region, . . . . .	99	83	10	6	88.9
Georgian Bay, . . . . .	98	80	12	6	87.8
Ottawa Valley, . . . . .	94	75	10	9	85.1
Upper St. Lawrence, . . . . .	97	78	12	7	86.6
Lower St. Lawrence, . . . . .	106	83	12	11	84.0
Gulf, . . . . .	103	77	16	10	82.5
Maritime Provinces, West, . . . . .	112	84	14	14	81.2
Maritime Provinces, East, . . . . .	112	82	17	13	80.8
Total, . . . . .	1003	785	123	95	84.4

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

The forecasts and storm warnings were issued by Forecast Official, B. C. Webber.

R. F. STUPART,

Meteorological Office, Toronto,  
26th April, 1902.

*Director.*



# METEOROLOGICAL SERVICE, DOMINION OF CANADA.

## Monthly Weather Review.

VOL. XXVI

APRIL, 1902.

No. 4

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### REMARKS UPON THE WEATHER.

In British Columbia there was much cool weather, and spring-like conditions were exceedingly backward. After the 14th it became somewhat warmer, but the temperature range between the 1st and 30th was small. Hard frost occurred almost daily at Revelstoke, and lighter frosts were unusually frequent at other places on the Upper Mainland, but on the Lower Mainland and Islands they were of only occasional occurrence. During the first half of the month clouded skies with rain were frequent, snow also being recorded at some places. After the 15th the weather improved, and with more sunshine vegetation showed more rapid growth.

The weather in the North-west Territories was quite cool throughout the greater part of the month, frosts at most places occurring almost daily. Up to about the 18th little rain or snow had fallen, but after that date light showers were more frequent. Much bright sunshine was recorded during the first three days; also from the 7th to 19th and 22nd to 26th, and it is doubtless owing to this bright weather that vegetation was generally recorded as in better condition on the 30th than at the same date in 1901.

In Manitoba, with the exception of comparatively warm weather from about the 9th to 17th and 25th to 30th, low temperatures generally prevailed, and although there were many days with bright sunshine, more especially during the first half of the month, vegetation in most districts was backward. Snow was recorded at most places, but the showers that fell were soon melted and there was little on the ground after the 7th.

In Ontario the fine weather of March which promised an early spring was unexpectedly followed by dull, cloudy weather, which lasted throughout the greater part of the month, and although the mean temperature somewhat exceeded the average at many places, this lack of sunshine quite reversed the conditions. In most districts much rain fell, more especially from the 7th to 12th and 22nd to 29th, but in the south-western portion of the Province it was deficient. An easterly gale set in on the 25th accompanied by thunderstorms. On the 26th, the wind having shifted to the west, the gale increased considerably, an average velocity of forty to fifty miles being recorded at many places.

In Western Quebec mild and spring-like weather set in about the 6th, and with the exception of cold weather on the 12th, 13th and 14th, comparatively high temperatures prevailed to the end of the month; in Eastern Quebec, however, there was little mild weather until the last few days of the month. Rain occurred rather frequently, and snow accompanied by high winds was recorded at most places on or about the 11th and 12th. In most districts vegetation was more forward than usual.

The weather in New Brunswick, although mild after the 12th, was quite cool up to that date, frosts occurring frequently at most places throughout the month. From the 10th to the 15th there was rain each day in most districts, rain also occurring frequently after the 20th, and at some places rain was recorded on the first three or four days. Vegetation made rapid progress during the last four days, but was still backward on the 30th.

In Nova Scotia the weather conditions were very similar to the conditions in New Brunswick, cool weather prevailing during the first half of the month, when there was little growth in vegetation and milder weather during the second half, more especially during the last three or four days. Snow was recorded at some places on or about the 6th, but the precipitation was generally rain.

In Prince Edward Island there was much fine mild weather, more especially towards the end of the month when vegetation made rapid progress. Rainy periods occurred from 1st to 4th, 10th to 13th, also on or about 15th, 22nd, 28th and 29th. Frosts were recorded at most places, but with few exceptions were not severe.—  
F. F. PAYNE

#### ATMOSPHERIC PRESSURE.

The mean atmospheric pressure of the month varied considerably over the different portions of the Dominion. In British Columbia, the North-west Territories and in Cape Breton it was just about the normal. In Manitoba it was from average to .05 of an inch above, while from Lake Superior to the Gulf of St. Lawrence, including the northern part of the Maritime Provinces, it was from .05 to .17 of an inch below the average, the greatest deficiency occurring in the Lower St. Lawrence Valley.

#### HIGH AREAS.

There was a considerable amount of high pressure during the month; eight areas were charted, but none of them were of any great energy.

No. 1 on the morning of the 1st covered the Continent between the Rockies and the Missouri and Mississippi Valleys, as well as the North-west Territories and Manitoba, accompanied in its Canadian portion by fine cold weather. It then moved slowly into the Upper Lake Region with diminishing energy, and on the 4th, receded southward to Tennessee and broke up. No. 2 moved into the North-west Territories during the night of the 5th, and after reaching Manitoba on the following evening it passed far northward over Canada to the Straits of Belle Isle. It was an energetic area accompanied by low temperatures, but its accompanying cold wave, except in northern localities, was not very general. No. 3 appeared off the Coast of Southern California on the morning of the 7th, and drifting over the larger portion of the Continent, its centre passed into the North-west Territories and Manitoba, and then after the 13th it receded southward over the Lake Region and off the United States Atlantic Coast. During its presence in Canada between the 11th and 15th fine weather generally obtained. No. 4 moved into the North Pacific States and British Columbia between the 11th and 13th and then dispersed, its influence not extending to the eastward of the Rocky Mountains. No. 5 was a very moderate area which appeared in Manitoba on the 18th, and travelled south-south-eastward over Lakes Superior and Michigan to the Central States, and thence on the 21st off the Carolina Coast. Fair weather was its general accompaniment. No. 6 travelled quickly across the Continent between the 22nd and 25th from the Middle Pacific to the Middle Atlantic Coast. During its presence fine weather was generally experienced in Canada. No. 7 was another moderate area travelling much in the same path as its predecessor. On the 25th morning it passed off the Coast of Virginia. No. 8 moved into Manitoba during the night of the 28th, and by the night of the 30th had reached Lake Superior.

#### LOW AREAS.

Ten areas of low pressure were charted during the month, which is quite the average number for April for a long period of years, and there were besides other minor depressions whose paths were too doubtful to allow of them being accurately traced.

No. 1 was situated on the Washington Coast, North Pacific States, on the morning of the 1st. Its movement was then slowly over British Columbia, the Territories and Manitoba to the Lake Region, breaking up on the 7th in the Lower Lake Region. It caused numerous showers in British Columbia and local snow and rain in the Lake Region, but little or no precipitation elsewhere. No. 2 was centred near Arizona on the 1st, and travelling almost directly eastward, it reached the North Carolina Coast on the evening of the 4th, and thence north eastward to the Atlantic, passing not far from the Maritime Provinces, where on the 5th it caused strong north-easterly winds with snow and rain. No. 3 appeared in New Mexico on the 9th, and after reaching the South Atlantic States on the evening of the 7th, it changed its course to the north-eastward and developed rapidly. From Virginia its path was northward over Pennsylvania, but afterwards it again took the north-easterly direction, and on the 11th broke up over the Maritime Provinces. This area caused an easterly gale very generally in Canada from the Lakes to the Atlantic Coast with snow in the Gulf of St. Lawrence and the eastern portion of the Province of Quebec and rain elsewhere. No. 4 passed from the Pacific Ocean over British Columbia and Alberta to Saskatchewan between the 6th and 8th, and then appears to have dispersed; it was accompanied by high winds, showers and local snowfalls which extended eastward into Manitoba. No. 5 first appeared on the 19th in Minnesota. It developed as it travelled eastward to the Gulf of St. Lawrence and was not very energetic. Showers were experienced generally over its course together with light snowfalls in the Upper Lake Region and in Quebec. No. 6 was a moderate depression which between the 16th and 19th travelled from Northern British Columbia to the Ohio Valley and Tennessee and then dispersed. It caused light showers in nearly all parts of Canada. No. 7 appeared in British Columbia on the 18th, and travelling at

first south-eastward it reached Kansas on the 21st, when it was a widespread and pronounced disturbance with a second focus situated in Utah. The system then changed its course to the north-eastward, arriving in the Lake Superior district early on the 23rd and passing into the Gulf of St. Lawrence on the 24th. A feature of the disturbance was the high wind which attended it in nearly all parts of Canada. It also brought a fall of snow in the Territories and Manitoba and local showers and thunder storms in Ontario, Quebec and the Maritime Provinces. No. 8. was situated in the Middle Pacific States on the morning of the 24th where it appears to have developed. It travelled as a very energetic area into the Lake Region, thence with diminishing intensity into the Gulf of St. Lawrence. It caused in Ontario heavy rains with numerous thunder-storms as well as a fresh to heavy gale. In Quebec and the Maritime Provinces, owing to its influence, rain also fell heavily, but the winds only increased locally to moderate gales. No. 9 lay over the North-west Territories between the 26th and 27th; it then passed over the North west States to the Lake Superior district. On the morning of the 30th, when situated in the Ottawa Valley, it had united with No. 10, another very moderate depression which meanwhile had travelled from the Middle Pacific States to and over the Lower Lake Region. The system then moved into the Maritime Provinces and broke up. Showers and local thunderstorms were experienced from the Lake Region to the Maritime Provinces during the presence of these depressions but not elsewhere in Canada, except very locally.

### WINDS.

In British Columbia, in Vancouver Island and the Lower Mainland the direction was variable, favouring to a small extent the westerly. The force of a moderate gale was attained on two occasions, and there were besides ten days on which the wind increased to a fresh or strong breeze.

In the North-west Territories the direction was more between the easterly and westerly than from other points. Two gales were experienced generally, and there were five days of strong, and twelve days of fresh breezes.

In Manitoba the direction was also more westerly and easterly than from other points. Two gales occurred and ten days of strong and nine days of fresh breezes.

In the Lake Region the direction was variable. Three gales were experienced namely on the 8th, 22nd and 26th, the latter being by far the most important. There were also fifteen days on which the force of a fresh or strong breeze was recorded.

In the Ottawa and St. Lawrence Valleys and the Gulf the direction was also largely variable but favouring somewhat the westerly. Fresh to strong breezes occurred on about eighteen days, but the force of a gale was only reached on two occasions.

In the Maritime Provinces the direction had a westerly tendency on fifteen days, and an easterly on seven days. There were fourteen days of fresh breezes, four of strong breezes, and moderate gales occurred between the 9th and 10th and on the 26th.

The gales in the Lake Region and the Maritime Provinces were successfully warned, but in the Lower St. Lawrence Valley and the Gulf the warning issued on the 26th was not verified, and local gales on the 30th were not warned.

### TEMPERATURE.

The temperature was average to 2 below from the interior of British Columbia to and including Manitoba, and above average in all the remaining parts of the Dominion excepting in the extreme south-western portion of Ontario, where it was just average. The excess was very marked in the Ottawa and St. Lawrence Valleys and over the greater portion of the Maritime Provinces, amounting as it did in many localities to 5 or 6 degrees.

*The Highest and Lowest temperatures in each Province during April, 1902, were*

British Columbia,	74.4 on 15th at Chilliwack,	6.8 on 10th at Vancouver.
North-west Territories,	73.0 on 28th at Edmonton,	17.0 on 1st at Athabasca Landing.
Manitoba,	69.5 on 30th at Aweme,	8.8 on 7th at Pembina Crossing.
Ontario,	81.0 on 22nd at Cottam,	1.0 on 7th at Savanne.
Quebec,	78.0 on 24th at Richmond,	6.0 on 1st at Percé.
New Brunswick,	76.0 on 29th at Chatham,	20.7 on 7th at Sussex.
Nova Scotia,	74.7 on 30th at Truro,	20.5 on 5th at Sydney.
Prince Edward Island.	73.0 on 25th at Hamilton,	24.3 on 5th at Summerside.

## BRIGHT SUNSHINE.

There was much less than average sunshine over the greater part of the Dominion, except in Manitoba where there was a slight excess at Brandon, and an excess of 14 per cent at Winnipeg. Montreal recorded 19 per cent below the average amount, Lindsay 17 per cent below, and Kingston and Woodstock 13 and 11 per cent below respectively.

## PRECIPITATION.

Precipitation was below the average everywhere excepting in the Province of Quebec, and in the central and eastern portions of Ontario. In Quebec the excess varied from two to six-tenths of an inch, but in those portions of Ontario where the average was exceeded the plus amounts varied greatly—probably owing to the effect of local thunderstorms, which were of rather frequent occurrence. Victoria, B.C., was one and a half inches below the average, the Territories and Manitoba from one to seven tenths below, and the Maritime Provinces from a few tenths to over an inch below. Very little snow fell during the month.



# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, APRIL, 1902.

*a.* Barometer not reduced to Sea Level. \* Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	PRESSURE.				TEMPERATURE.				DIRECTION OF WIND FROM				VELOCITY OF WIND				PRECIPITATION.		No. of days with or more.	No. of Anomalous.	No. of fair days.	No. of Fogs.	
			Mean to highest.	Highest.	Lowest.	Range.	Mean daily.	Mean relative humidity.	Mean amount of rain.	No. of days complete.	N.	N.E.	E.	S.E.	S.	W.	W.N.W.	Total number of hours.	Mean miles per hour.	Direction, day's velocity.	Date and direction from.	Amount.	Puff average.	Heavyest fall in month.	
N.W. Thermograph:—Cont.																									
Indian Head	50 25 103 40	104					11 54.4												0				0.20	0.30	0
Cunningham Manor	44 44 113 24	261					11 54.4												0				0.20	0.30	0
Shedden	44 44 113 24	261					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	1870					11 54.4												0				0.20	0.30	0
Gaspe	48 15 65 50	187																							







OBSERVATIONS AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
APRIL, 1902.

STATIONS.	RAINFALL.					SNOWFALL.					Remarks.
	Amount in inches.	No. of Days of or Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month.	Date.		
BRITISH COLUMBIA—	in.			in.		in.		in.			
Caulfields, .....	2.96	14	14	0.52	8						
Nasas Harbour, .....	1.34	14	14	0.20	29	13.0	3	7.0	9		
Coquitlam, .....	6.08	12	18	2.11	17, 18	3.3	1	3.3	8		
Goldstream Lake, ....	4.00	18	12	0.78	7	14.0	4	6.0	9		
Kuper Island, .....	1.82	15	15	0.43	7					19th, ice; 12th, ice	
Nanaimo (City), ....	1.24	3	27	0.70	6, 7						
Royal Oak, .....	1.60	13	17	0.42	7		1		7		
Port Essington, ....	3.66	16	13	0.95	10	0.5	3	0.3	9	Flowers in bloom; trees in leaf on 30th.	
N. W. TERRITORIES—											
Beaver Hills, W., .....	0.77	4	24	0.42	17	0.3	3	0.3	5	22nd, lawn getting green.	
Dirt Hills, .....	9.74	4	24	0.34	19	9.0	3	8.0	20		
Broomhall, .....						4.7	3	1.8	24		
Regina, .....	0.15	1	25	0.15	8	4.0	3	4.0	20		
Didsbury, .....						1.0	3	1.0	23		
Imperial, .....	0.02	1	25	0.02	30		2		24		
Salteoats, .....						3.0	1	3.0	20		
Contra, .....										Dry and windy all month.	
Weyburn, .....	1.33	5	25	0.58	20	2.0	1	2.0	20		
Abernethy, .....	0.04	1	27	0.04	30	5.8	2	5.5	20		
Beaver Hills, E., .....	0.61	4	26	0.25	19		3			Snow included in rain.	
MANITOBA—											
Oakbank, .....	0.35	1	22	0.55	28	7.5	5	2.2	20		
Morden, .....	R	0	27				2				
Belmont, ....	0.13	1	26	0.13	28		2				
Norquay, .....						1.5	7	1.0	18		
ONTARIO—											
Godfrich, .....	1.40	4	25	0.50	26	2.0	18	2.0	7	Wind 44 miles per hour on 26th.	
Wooler, .....	3.87	8	21	1.85	8, 9		1		2	24th, terrible wind storm.	
Newburgh, .....	3.11	8	22	1.02	8						
Cayuga, .....	1.54	7	14	0.24	7		4			27th, wind 50 miles per hour.	
Emisdale, .....	1.99	10	15	0.88	27		5			23rd, hail storm.	
Croydon, .....	3.00	3	26	1.20	9		1				
Midland, .....	1.77	11	19	0.55	25		1			Aurora on 10th	
Westminster, .....	1.54	6	21	0.41	7	2.0	2	2.0	8		
Scarborough, .....	2.06	7	20	0.61	22	0.1	3	0.1	4		
Orangeville, .....	3.72	6	21	1.30	26	5.1	3	5.1	2		
Georgetown, .....	2.39	9	15	0.55	9	0.5	4	0.3	4		
Ashby, .....	3.24	14	16	1.26	10						
Huntsville, .....	1.55	5	24	0.95	26	0.5	1	0.5	1		
Leon's Head, .....	2.27	7	23	0.89	26						
Dutton, .....						0.5	2	0.5	8		
Sunshine, .....	1.67	6	10	0.89	25	5.3	4	2.0	1		
Deer Park, .....	2.11	10	20	0.66	25		1		4		
Ursa, .....	2.00	9	21	0.45	25						
Providence Bay, .....	2.19	11	17	0.97	26	3.5	3	2.0	7		
Lynnbeth, .....	2.03	5	25	0.83	29						
Dealtown, .....	1.14	6	24	0.42	29		1		13	24th, ice	
Oliver's Ferry, .....	2.08	9	21	0.49	30						
Watford, .....	1.47	5	25	0.45	25						
Westport, .....	3.91	7	23	1.22	26						
Jernyn, .....	2.63	4	26	1.14	26						
Lausdowne, .....	1.89	5	25	0.56	30						
Wyoming, .....	0.48	2	25	0.37	25	3.0	3	1.0	7		
Aurora, .....	2.13	9	21	0.82	25		1		1		
Parma, .....	3.00	6	24	0.90	5						
Wootton, .....	2.24	6	20	0.72	26	2.0	4	2.0	7		
Montague, .....	2.44	5	25	0.93	26						
Port Burwell, .....	1.25	8	20	0.47	30	4.0	4	5.0	8		
Pinckton, .....	1.93	8	22	0.83	8						
Emmetsburg, .....	2.11	5	25	0.85	25						
Nottawasaga, .....	1.90	5	24	1.00	26						
Missinabie, .....	0.94	4	24	0.30	26	4.0	2	2.0	6		
NEW BRUNSWICK—											
Point Eschumac, .....	1.24	4	24	0.57	1	4.2	2	4.2	10, 11		
NOVA SCOTIA—											
Port Morden, .....	1.88	7	21	0.64	10	3.0	2	3.0	5, 6		

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF APRIL, 1902.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria	0.00	0.10	0.18	0.38	0.42	0.46	0.56	0.63	0.60	0.58	0.47	0.38	0.25	0.04		
Nanaimo	0.06	0.27	0.31	0.31	0.36	0.42	0.42	0.41	0.44	0.45	0.43	0.52	0.40	0.09		
Agassiz	0.00	0.02	0.06	0.24	0.33	0.34	0.43	0.44	0.47	0.46	0.37	0.18	0.12	0.02		
Battleford	0.13	0.40	0.49	0.51	0.56	0.62	0.62	0.61	0.71	0.64	0.61	0.56	0.45	0.27	0.01	
Indian Head																
Brandon	0.18	0.46	0.57	0.62	0.60	0.57	0.56	0.61	0.62	0.57	0.56	0.34	0.04	0.00		
Winnipeg	0.15	0.45	0.68	0.67	0.69	0.66	0.71	0.70	0.66	0.65	0.59	0.50	0.34	0.05		
Woodstock	0.00	0.13	0.26	0.36	0.47	0.51	0.53	0.50	0.42	0.36	0.34	0.29	0.18			
Toronto	0.00	0.11	0.37	0.48	0.57	0.55	0.58	0.60	0.54	0.55	0.50	0.35	0.27	0.08		
Lindsay	0.02	0.13	0.36	0.43	0.43	0.46	0.53	0.49	0.47	0.43	0.27	0.24	0.21	0.13		
Barrie	0.04	0.17	0.32	0.43	0.47	0.50	0.50	0.43	0.45	0.43	0.38	0.36	0.26	0.07	0.01	
Kingston	0.00	0.09	0.33	0.44	0.45	0.52	0.50	0.42	0.50	0.50	0.43	0.38	0.19	0.02		
Ottawa	0.04	0.19	0.31	0.41	0.43	0.53	0.54	0.59	0.56	0.53	0.56	0.42	0.25	0.03		
Montreal	T	0.14	0.36	0.55	0.31	0.34	0.36	0.35	0.35	0.39	0.40	0.36	0.08	0.00		
Fredericton	0.01	0.28	0.42	0.47	0.47	0.51	0.52	0.52	0.50	0.48	0.44	0.46	0.37	0.12		

	Victoria	Nanaimo	Agassiz	Battleford	Indian Head	Brandon	Winnipeg	Woodstock	Toronto	Lindsay	Barrie	Kingston	Ottawa	Montreal	Fredericton
Mean proportion for month. (Constant sunshine being 1.)	0.37	0.36	0.25	0.52		0.46	0.54	0.32	0.41	0.33	0.36	0.35	0.40	0.32	0.41
Difference from average	0.02	—	0.00	0.00		0.01	0.14	0.11	0.08	0.17	0.00	0.13	0.10	0.19	0.05
Maximum daily amount.	0.81	0.90	0.71	0.99		0.85	0.92	0.86	0.86	0.95	0.95	0.80	0.86	0.95	0.95
Date	24	12	24	4		6	29	27	28	15	28	18	28	28	16
No. of days completely clouded.	3	3	9	2		4	6	9	5	4	5	7	4	9	6

*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

1. Pembina Crossing, III.
2. Rat Portage, IV ; Melfort, IV ; Channel Island, IV.
3. Chicoutimi.
4. Chicoutimi, Toronto, IV.
8. Bowsman, IV ; Aweme, III.
9. Bowsman, IV.
10. Belmont, Midland, II ; Georgetown, IV ; Banff, IV ; Calgary, II ; White River, *very brilliant*, Bullion, Swift Current, IV ; Haileybury, I ; Cockburn Island, Rocklyn, Lucknow, I ; Golden, Pincher Creek, Red Deer, II ; Knee Hill, Erasmus, Pembina Crossing, III ; Aweme, I ; Beaver Hills, II ; Channel Island, IV.
11. Bowsman, IV ; Pembina Crossing, III ; Battleford, II ; Minnedosa, I ; Bullion, Channel Island, IV.
12. Melfort, IV ; Minnedosa, III.
13. Savanne, Bowsman, IV.
14. Chicoutimi.
26. Channel Island, IV.
29. Oakbank, IV.
30. Brantford, IV.

*Thunder recorded on :—*

1. Point Rich.
5. Portage la Prairie.
7. Garry Point, Medicine Hat, Port Bobs.
8. New Westminster.
9. Bermuda.
11. Agincourt.
12. Dalhousie Mills, Tobacco Plains.
16. Barkerville, Quesnelle.
17. Dirt Hills, Barkerville.
18. Nicola Lake, Chaplin.
19. Gravenhurst, Agincourt, Erasmus, Sea boro, Georgetown, Swift Current.
20. Summerside, Midland.
21. Bermuda, Guelph, London, Stratford, Summerside, Sussex, Hamilton, Port Dover, Kinnmount, Stony Creek, Alberni, Midland, Dutton, Ursa, Westport, Wyoming, Princeton, Port Stanley.
22. Gravenhurst, Haileybury, Point Lepreaux, Chicoutimi, Richmond, Abitibi, Haliburton, Clontarf, Arden, Quebec, St. John, White River, Port Arthur, Port Stanley, Ottawa.
23. Sussex, Port Dover.
25. Stratford, Hamilton, Port Hope, Dunnville, Alton, N. Nicomen, Erasmus, Georgetown, Arden, Providence Bay, Westport, Aurora, Nottawasaga, Toronto, Saugeen.
26. Parma, Wiarton, Deerpark, Charlottetown, Parry Sound, Toronto, Port Stanley, Lindsay, Truro, Perce, Bathurst, Richmond, St. Catharines, Paris, Agincourt, Meaford, Peterboro', Welland, Scarboro, Georgetown, Arden, Lion's Head, Deer Park, Westport.
27. Summerside, Bathurst, Paris, Tobacco Plains, Grand Manan, Swift Current.
28. Crane Lake.
29. Athabasca Landing, Crane Lake, Savanne, Swift Current.
30. Richmond, Bowsman, Weyburn, Arden.

*Appearance of Spring Birds, &c. :—*

ROBINS.—Edmonton, 2nd ; Moose Jaw, 12th ; Crescent Lake, 10th ; Athabasca Landing, 30th ; Hillview, 24th ; St. Stephen, 1st ; Beaver Hills, W., 21st, Channel Island, 30th.

DUCKS.—Edmonton, 5th ; Chaplin, 1st ; Moose Jaw, 12th ; Knee Hill, 1st ; Red Deer, 4th ; Melfort, 5th ; Crescent Lake, 7th ; Hillview, 4th ; Beaver Hills, W., 5th ; Beaver Hills, E., 3rd, Channel Island, 25th.

GEESE.—Edmonton, 5th ; Chaplin, 2nd ; Moose Jaw, 7th ; Red Deer, 2nd ; Melfort, 2nd ; Crescent Lake, 2nd ; Athabasca Landing, 29th ; Savanne, 3rd ; Hillview, 4th ; Portage la Prairie, 3rd ; Bowsman, 11th ; Beaver Hills, W., 5th ; Abernethy, Beaver Hills, E., 3rd, Channel Island, 3rd.

SWALLOWS.—Alberni, 16th ; Cranbrook, 21st ; N. Nicomen, St. Stephen, 24th ; (Martin) Agincourt, 28th ; Peterboro', 17th ; Lakefield, 21st ; Ridgetown, 19th ; Ursa, 19th ; Scarboro, 16th.

BLACKBIRDS.—Crescent Lake, 14th ; Hillview, 21st ; Bowsman, 13th, Channel Island, 30th.

BLUE BIRDS.—Chicoutimi, 7th ; Lakefield, 25th ; Emsdale, 15th.

MEADOW LARKS.—Moose Jaw, 11th ; Knee Hill, 18th ; Crescent Lake, 4th ; Hillview, 13th ; Lakefield, 27th ; Abernethy, 19th.

CROWS.—Knee Hill, 3rd.

PLOVERS.—Crescent Lake, 11th ; Hillview, 14th.

FROGS.—Edmonton, 10th ; Moose Jaw, 27th ; Knee Hill, 18th ; Red Deer, 17th ; Melfort, 25th ; Crescent Lake, 10th ; Savanne, 27th ; Clontarf, 1st ; Hillview, 12th ; Pembina Crossing, 15th ; Bowsman, 12th ; Beatrice, 6th ; Haliburton, 14th ; Paris, 1st, Agincourt, 11th ; Bruce Mines, 15th ; Oakbank, 9th ; Summerside, 23rd ; Huntsville, 9th ; Scarboro, 14th ; Emsdale, 15 ; Beaver Hills, W., 16th ; Abernethy, 14th.

## FORECASTS FOR APRIL, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1036. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			Percentage
		No. Fully	No. Partly	No. Not	
Manitoba . . . . .	88	60	19	9	79.0
Lake Superior . . . . .	103	90	10	3	92.2
Lower Lake Region . . . . .	117	101	7	9	89.3
Georgian Bay . . . . .	113	92	11	10	86.3
Ottawa Valley . . . . .	99	78	12	9	84.8
Upper St. Lawrence . . . . .	101	79	11	11	83.7
Lower St. Lawrence . . . . .	105	80	15	10	83.3
Gulf . . . . .	103	75	15	13	80.1
Maritime Provinces, West . . . . .	103	81	15	7	85.9
Maritime Provinces, East . . . . .	101	83	13	8	86.0
Total . . . . .	1036	819	128	89	85.2

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

The forecasts and storm warnings were issued by Forecast Official, B. C. Webber.

R. F. STUPART,  
*Director.*

Meteorological Office, Toronto,  
26th May, 1902

# METEOROLOGICAL SERVICE, DOMINION OF CANADA.

## Monthly Weather Review.

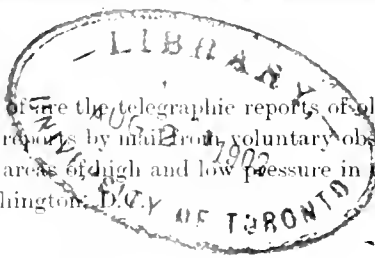
VOL. XXVI

MAY, 1902.

No. 5

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington.



### REMARKS UPON THE WEATHER.

The weather over the Lower Mainland and Islands of British Columbia was generally cloudy and dull, but with this exception and somewhat excessive rain in a few places the conditions differed little from the normal. The most important rainy periods were from the 10th to 17th, and 25th to 30th, when much rain fell in most districts. Over the Upper Mainland clouded skies were more frequent than elsewhere, and showers were also unusually frequent, but with these exceptions the weather was similar to that in the western portion of the Province. Frosts occurred upon several days over the Upper Mainland, but did little damage, and the condition of vegetation was normal.

In the North-west Territories the weather conditions varied with the districts, more especially with regard to the rainfall, it being especially heavy in the western portion, while elsewhere it was lighter. In Southern Alberta there was much damage by flooding. Clouded skies were frequent everywhere, but in eastern districts much finer weather prevailed. At Calgary, Alberta, a heavy snow storm occurred on the 1st, and continued to the 3rd: snow was also recorded at several other places on or about these dates. Although low temperatures occurred during the first half of the month when frosts were rather frequent, there were many warm days, and altogether the weather was somewhat warmer than usual in most districts. In Alberta the condition of vegetation was not satisfactory, but elsewhere it was normal.

In Manitoba comparatively cool weather prevailed up to about the 11th, after which considerably higher temperatures occurred and continued, with the exception of a few short periods, to the end of the month. Much cloudiness was recorded, but there were many fine, bright days: and although the rain was excessive and light frosts were frequent during the first half of the month, the condition of vegetation was most favourable.

The weather in Ontario did not depart much from the normal, but in most districts there were frequent low temperatures and comparatively little rain, whilst at a few places these conditions were reversed. From the 9th to 15th, and 27th to 31st, quite cool weather prevailed, destructive frosts occurring on the 9th, 10th and 11th. Most of the rain that occurred fell before the 9th and after the 18th, dry weather in most districts being recorded between these dates. On the 22nd thunderstorms accompanied by heavy squalls were general, house property being much damaged and many trees uprooted. On the 31st the condition of vegetation was normal.

In the Province of Quebec comparatively cool weather prevailed throughout the month, and the range of temperature between the first and last day was small. Clouded skies were frequent, and in most districts there was much rain, this being more especially the case in the western portion. Dry periods occurred from the 11th to 19th in western counties, and 1st to 7th and 15th to 22nd in eastern districts. Snow was recorded on several days between the 9th and 18th in the western portion of the Province. Frosts were rather frequent up to the 21st, doing considerable damage, and vegetation was generally backward on the 31st.

The weather in New Brunswick, with the exception of a comparatively fine dry period from the 10th to the 22nd, was mostly dull and wet. Up to the 22nd cool weather prevailed in most districts, but after that date it became considerably warmer and continued so until the 29th, low temperatures again occurring on the 30th and 31st. Frequent frosts, which, in some instances were severe, retarded growth in vegetation, it being quite backward on the 31st.

In Nova Scotia the weather did not depart much from the normal, but in most districts there was excessive cloudiness and fog from the 1st to the 10th, and 22nd to 30th, and it was quite cool up to the 13th. After this latter date the temperature increased, but no warm weather occurred until after the 24th. Frosts were recorded rather frequently at most places, and vegetation made little growth until late in the month. An exceptionally fine mirage was noted at Halifax on the 29th.

The weather conditions in Prince Edward Island were somewhat similar to conditions in New Brunswick, a comparatively fine and dry period occurring between the 12th and 22nd. In this Province, however, the rainfall was generally deficient, and damaging frosts were not quite so frequent. Warm weather prevailed from the 24th to 29th, when vegetation, which was quite backward, made rapid growth.—F. F. PAYNE.

### ATMOSPHERIC PRESSURE.

The mean pressure was above the normal value over the Lake Region and Upper St. Lawrence Valley and below over other parts of the Dominion, except in Cape Breton and Prince Edward Island, where it was just average. The largest positive departures recorded were 0.10 inch at White River, Ontario, and 0.09 inch at Bissett, and the largest negative departures were 0.08 inch and 0.09 inch in Assiniboia and Saskatchewan.

### HIGH AREAS.

Nine areas of high pressure have been charted during the month: of this number six finally passed out to sea between the 30th and 40th parallels of latitude, the remaining three passing over the Gulf of St. Lawrence and the Maritime Provinces.

No. 1 was a continuation of No. 8 on the April chart, and on the morning of the 1st was over New Ontario, and thence moved eastward down the St. Lawrence Valley, passing over the Gulf on the night of the 2nd. It was followed rapidly by No. 2, which formed over the Lake Superior District during the night of the 2nd, and moved eastward, passing over the Maritime Provinces on the 4th. During the passage of these areas, local frosts occurred in Ontario, Quebec and the Maritime Provinces. No. 3 was first observed over the North Pacific States on the 3rd, whence it passed to the North-west Territories and then eastward across the Great Lakes and over the Maritime Provinces during the 6th. It was accompanied by frost throughout the Territories and Manitoba on the 4th and 5th, and on the night of the 6th by local frost in the Maritime Provinces. No. 4 formed over Wyoming on the 6th, and moved south-east and east, passing off the Middle Atlantic Coast on the 9th. No. 5 appeared over Northern Alberta on the evening of the 7th and pursued a south-easterly course, passing out to sea over the Middle Atlantic States on the 12th. Heavy frosts occurred in the North-west Territories, Manitoba and Northern Ontario, and light frosts in Southern Ontario, Quebec and the Maritime Provinces during its passage. In conjunction with Low Area No. 1 it caused moderate to heavy gales from the Lakes to the Maritime Provinces between the 8th and 11th. No. 6 moved into Manitoba from the northward during the night of the 12th, and passed south-east and off the Middle Atlantic Coast on the 16th. It was accompanied by local frosts in Ontario. No. 7 moved south from James Bay on the 20th, passed over the Lakes and out to sea from the Middle Atlantic States on the 22nd. No. 8 was over the North-west Territories on the 24th, and took a south-east and east course, passing off the Middle Atlantic Coast on the 30th. It caused local frost in Northern Ontario on the night of the 27th. No. 9 took a somewhat similar course to No. 7, moving south east from James Bay on the 29th, and off the Southern New England Coast on the 31st.

### LOW AREAS.

No. 1 formed over the Pacific States during April 30th, and moved to Lake Superior, reaching there on the 2nd, thence it passed south-eastward to the Upper St. Lawrence Valley, where it dispersed during the 3rd. It was accompanied by heavy rain and strong winds to moderate gales in the North-west Territories and Manitoba on the 1st, and moderate gales on Lake Superior during the night of the 1st and morning of the 2nd. Showers were also very general in Ontario on the 2nd. No. 2—During the 2nd and 3rd the entire west was covered by low pressure, and heavy local snowfalls occurred in Alberta on the first-mentioned date, showers being recorded in other portions of the Territories. By the evening of the 3rd, the system was centred

over Iowa and Kansas, thence it moved rapidly north-east over the Lower Lakes and down the St. Lawrence Valley, passing out to sea during the 5th. It was accompanied by showery weather throughout its course. No. 3 developed over Texas during the 4th and 5th and moved rapidly north-eastward, reaching the Straits of Mackinac by the evening of the 6th, and was accompanied by rain in Ontario. It caused moderate local gales on the Lakes on the 7th as it moved eastward, and rain with local gales in the Gulf on the 7th and 8th as it passed out to sea. No. 4 was the most important depression of the month. It was centred over Alberta on the evening of the 6th, and moved to Manitoba on the 7th, causing showers and local thunderstorms in the latter Province. On the night of the 8th it developed great energy as it moved down the St. Lawrence Valley, and passed beyond the range of observation on the 11th. Its accompanying gales were heavy in the Lake Region, and moderate to heavy in the Gulf and Maritime Provinces. Showers and local thunderstorms were also experienced throughout its course. Nos. 5 and 6—From the 8th to the 24th pressure was low over the Western States and Territories, and a number of low pressure areas formed; the most of them had very erratic courses in the west, and did not reach the Lake Region. Unsettled weather with showers was of almost daily occurrence in the Territories and Manitoba during this period. On the evening of the 18th the system was apparently centred over Colorado, thence moving to Assiniboia, reaching there on the 21st. From Assiniboia it drifted in an easterly direction; thunder squalls occurred in Ontario on the 22nd, by which much damage was done, and during the 23rd showers and local thunderstorms were experienced throughout Eastern Canada. The centre passed down the St. Lawrence and out to sea on the 25th, but the unsettled showery weather continued in Quebec and the Maritime Provinces, owing to the passage of No. 6, a subsidiary to No. 5, which formed over Wisconsin on the 24th, and moved across the Lakes on the 25th, passing down the St. Lawrence and over the Gulf by the 30th.

#### WINDS.

In British Columbia there was a preponderance of westerly winds: one fresh gale was recorded, and on some ten days the winds were fresh, but on most days they were light and variable.

A decided preponderance of easterly winds was a marked feature of the month in the North-west Territories, and of south-easterly winds in Manitoba. Westerly and north-westerly winds only occurred on four days; fresh to strong breezes were fairly frequent, but there were no gales.

Light to moderate variable winds were more frequent near Lake Superior than further west, especially during the first half of the month, but an easterly direction preponderated. The only strong winds, however, were easterly on the 2nd, and north-westerly on or about the 8th and 27th, and a fresh gale occurred on the 9th. In the Lower Lake Region there were two periods of strong west and north-west winds, from the 7th to the 10th, and from the 26th to the 29th, and a fresh gale was registered on the 9th. During the rest of the month light to moderate winds were prevalent with a slight preponderance of easterly.

In the St. Lawrence Valley and Maritime Provinces south-west and westerly winds were most frequent. A gale blew in the St. Lawrence Valley on the 9th, and in the Gulf on the 9th and 10th, and in both Gulf and Maritime Provinces strong winds were of frequent occurrence.

#### BRIGHT SUNSHINE.

Montreal, Ottawa and Toronto with respectively 51, 50 and 18 per cent of the possible amount, registered more bright sunshine than any other stations in the Dominion: Agassiz and Nanaimo, B.C., with 20 and 33 per cent, registered the least. The greatest positive departures from average were 3 per cent at Toronto and 2 per cent at Woodstock and Barrie, and the largest negative departures were 11 per cent at Agassiz and 16 per cent at Winnipeg. A general summary of the whole indicates a deficiency of sunshine over the western portion of the Dominion and either average amount or a slight excess from Lake Huron eastward to the Maritime Provinces.

#### TEMPERATURE.

The temperature was from average to 1° above in the western and central portions of the Lake Region, from 1° to 2° above in Assiniboia and Saskatchewan, 4° above in Manitoba, and elsewhere over the remaining portion of the Dominion it was from average to 2° below.

*The Highest and Lowest temperatures in each Province during May, 1902, were :*

British Columbia,	89°·0 on 26th at Chilliwack,	24°·0 on 24th at Barkerville.
North-west Territories,	90°·8 on 27th at Athabasca Landing,	21°·0 on 4th at Kneehill.
		21°·0 on 8th at Athabasca Landing
Manitoba,	94°·0 on 30th at Aweme,	23°·0 on 9th at Elkhorn.
Ontario,	90°·0 on 22nd at Cottam and Stony Creek,	14°·8 on 10th at Clontarf.
Quebec,	81°·6 on 23rd at Montreal,	18°·9 on 10th at Chicoutimi.
New Brunswick,	83°·0 on 23rd St. Stephen,	22°·0 on 19th at Sussex.
Nova Scotia,	74°·0 on 27th at Bridgetown,	18°·7 on 11th at Truro.
Prince Edward Island,	71°·6 on 25th at Charlottetown,	28°·3 on 14th at Summerside.

#### PRECIPITATION.

A marked feature of the month was a phenomenally heavy precipitation in the North-west Territories and over a large portion of British Columbia; many districts suffered greatly from freshets. In Manitoba abnormally heavy rains were also recorded, but to the eastward of this, in the Province of Ontario, the rainfall was very generally less than normal except just to the eastward of Georgian Bay, and also in the south-western counties, where there was a small excess. In Quebec and the Maritime Provinces it was above average to a small extent, except in Cape Breton, where there was a deficiency.









<sup>a</sup> Barometer not reduced to sea level.      Stations not furnished with Registering Thermometers.

[illegible]

OBSERVATIONS AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
MAY, 1902.

STATIONS.	RAINFALL.					REMARKS.
	Amount in inches.	No. of Days or Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.	
<b>BRITISH COLUMBIA—</b>	in.			in.		
Nas Harbour.	1.98	15	16	0.36	16	
Kuper Island.	2.42	15	16	0.46	15	10th, thunder and hail.
Cadfield.	1.20	14	15	0.87	15	
Nanaimo (City).	2.15	8	23	0.91	15	
Royal Oak.	1.17	13	17	0.53	14	30th, sharp frost.
Goldstream Lake.	1.85	15	16	0.47	15	
Casquitlan.	5.64	16	15	1.00	15	
Port Essington.	4.11	17	14	0.81	17	3rd, thunder-storm.
<b>N. W. TERRITORIES—</b>						
Ditt Hills.	4.41	13	18	0.83	19	16th, fog; 19th, thunder; 8th, snow.
Calgary.	2.16	12	18	0.55	2	18th, storm with hail and sleet.
Beaver Hills, W.	7.70	9	21	2.65	30	8th, snow; thunder 10th, 11th, 13th, and 30th.
Stirling.	8.81	10	21	3.12	19	
Conits.	4.35	8	23	1.85	20	
Weyburn.	3.76	12	19	0.86	18	8th, 2 in. snow; 26th, frost.
Imperial.	5.98	11	20	1.38	1	24th, snow covering ground.
Whitewood.	4.69	12	17	1.19	20	2nd, snow 2½ in.; 9th, snow 1½ in.
Salteaux.	3.80	5	26	1.15	17	9th, snow flurries.
Didsbury.	6.01	8	22	2.29	18	1st, 6 in. snow.
Regina.	3.41	15	16	0.61	21	9th, 2 in. snow.
Beaver Hills, N.E.	6.83					Details wanting.
Beaver Hills, E.	6.28	9	10	1.01	18	24th, 4 in. snow.
<b>MANITOBA—</b>						
Belmont.	3.30	8	22	1.53	1	
Oak Lake.	2.84	9	22	0.64	19	9th, 5 in. snow.
Beaver.	2.71	9	22	1.50	1	
Morden.	2.96	12	16	0.59	1	9th, snow flurries.
Norquay.	4.07	10	19	1.99	1	9th, 2 in. snow.
Cortwright.	3.82	10	19	1.35	1	9th, 8 in. snow.
Ullswater.	4.54	10	20	1.50	2	9th, 2 in. snow.
Oakdale Park.	2.52	9	22	0.74	1	9th, 4 in. snow.
<b>ONTARIO—</b>						
Godrich.	2.70	8	23	1.00	6	
Cayuga.	1.92	5	20	0.69	22	27th, snow; 29th, frost.
Deer Park.	1.94	8	23	0.66	7	
Smith's Falls.	2.41	11	20	0.47	7	20th, frost; 30th, frost.
Croydon.	2.15	5	26	0.85	25	10th, ice ½ in.; 29th, frost.
Georgetown.	2.20	16	12	0.72	6	
Emisdale.	4.23	14	17	0.95	24	9th, ice ½ in.; 10th, ice 1 in.; 27th, 2 in. snow; 29th, frost.
Jermyn.	2.91	7	24	0.58	7	29th, frost.
Wooder.	1.42	5	26	0.80	2	29th, frost.
Wyoming.	4.47	10	21	1.33	19	14th, ice.
Midland.	3.27	13	18	0.45	6	8th, ice ½ in.; 27-28th, frost.
Lansdowne.	2.44	7	24	0.70	24	
Arden.	2.29	13	18	0.43	25	10th, ice ½ in.; 29th, frost.
Providence Bay.	3.43	16	15	0.86	22	27th, snow.
Parma.	1.55	7	24	0.56	7	
Huntsville.	2.11	8	22	0.77	24	28th, snow.
N. Williamsburg.	2.15	8	23	0.45	8	9th, frost.
Ursa.	3.22	11	20	1.43	24	9th, temperature 18; 28th, ground covered with snow.
Port Burwell.	3.69	11	20	1.21	18	10th and 11th, frost.
Newburgh.	2.28	10	21	1.03	24	
Montague.	1.49	5	16	0.46	24	9th, ice 1 in.; 31st, frost.
Westport.	2.35	11	20	0.50	4	8th, snow; 9th, temperature 24; 29th, frost.
Warton.	3.81	12	19	0.91	25	8th, ice ½ in.; 27th, frost; 28th, frost.
Oliver's Ferry.	1.22	6	25	0.35	7	
Emismore.	1.95	5	26	0.68	23	
Sunshine.	2.52	11	20	0.57	6	
Scarboro.	2.29	7	23	0.74	6	10th, ice; 29th, frost.
Princeton.	1.27	5	26	0.82	6	8th, snow.
Westminster.	3.09	8	23	0.95	18	9th, snow; 27th, frost.
Watford.	2.92	6	25	0.76	6	
Dutton.	0.76	3	23	0.50	18	Frost on 10th, 11th, 12th, 14th, and 27th.
Leon's Head.	3.74	12	19	1.03	24	
Dealtown.	4.52	10	21	1.39	19	27th, 7 to 7.45 a.m., 0.89 in. rainfall; 29th, frost.
Orangeville.	2.35	9	20	0.62	7	27th, roofs white with snow.
Aurora.	1.98	9	22	0.57	22	
Nottawasaga Island.	3.90	10	21	0.80	18	
Mississauga.	0.80	3	27	0.30	2	28th, 0.2 in. of snow.
Uxbridge.	2.79	13	18	0.55	22	Thunder on 8th, 22nd, 23rd, and 26th.
<b>NEW BRUNSWICK—</b>						
Point Escomiac.	3.98	9	22	1.33	24	13th, hard frost.
<b>NOVA SCOTIA—</b>						
Port Morien.	1.99	9	22	0.40	26	

PROPORTION OF RIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF MAY, 1902.

	Hours Elapsed															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
A	0.00	0.00	0.11	0.18	0.40	0.41	0.53	0.58	0.55	0.50	0.40	0.41	0.40	0.40	0.23	0.00
N.	0.00	0.00	0.15	0.37	0.50	0.37	0.41	0.45	0.42	0.40	0.50	0.56	0.40	0.50	0.26	0.02
E	0.00	0.00	0.17	0.39	0.47	0.28	0.32	0.37	0.34	0.33	0.38	0.27	0.21	0.25	0.06	0.00
P.	0.00	0.00	0.00	0.00	0.53	0.50	0.50	0.50	0.48	0.52	0.47	0.47	0.41	0.34	0.26	0.00
W.	0.00	0.00	0.00	0.00	0.41	0.50	0.53	0.50	0.51	0.57	0.61	0.60	0.50	0.47	0.44	0.30
B.	0.00	0.00	0.12	0.25	0.46	0.50	0.57	0.46	0.40	0.54	0.52	0.46	0.37	0.30	0.00	0.00
W.	0.00	0.00	0.00	0.00	0.43	0.43	0.44	0.46	0.41	0.48	0.52	0.41	0.41	0.37	0.15	0.00
W.	0.00	0.00	0.00	0.00	0.36	0.52	0.40	0.53	0.67	0.68	0.66	0.62	0.43	0.38	0.47	0.23
L.	0.00	0.00	0.00	0.00	0.51	0.52	0.70	0.60	0.60	0.61	0.61	0.64	0.60	0.40	0.34	0.04
L.	0.00	0.00	0.02	0.43	0.48	0.46	0.36	0.30	0.51	0.52	0.41	0.41	0.30	0.32	0.06	0.00
B.	0.00	0.00	0.00	0.00	0.30	0.41	0.51	0.40	0.47	0.30	0.60	0.45	0.64	0.45	0.27	0.00
C.	0.00	0.00	0.00	0.00	0.00	0.38	0.62	0.48	0.30	0.51	0.40	0.50	0.50	0.50	0.42	0.11
K.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.30	0.55	0.44	0.38	0.15	0.00	0.00
C.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.62	0.54	0.47	0.41	0.22	0.00
M.	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.60	0.50	0.62	0.53	0.50	0.50	0.38	0.07	0.00
L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.40	0.50	0.44	0.34	0.02	0.00

	A	N.	E	P.	W.	B.	W.	L.	L.	K.	C.	K.	C.	M.	L.
W. 1000 ft.	0.00	0.00	0.47	0.50	0.41	0.38	0.46	0.40	0.41	0.45	0.46	0.45	0.50	0.51	0.40
W. 1000 ft.	0.00	0.00	0.41	0.63	0.68	0.09	0.16	0.02	0.00	0.05	0.02	0.02	0.00	0.00	0.00
M. 1000 ft.	0.00	0.00	0.00	0.97	0.82	0.86	0.90	0.90	0.80	0.92	0.92	0.93	0.87	0.89	0.95
Days	0	0	37	6	0	28	30	34	15	11	15	15	10	12	41
No. of days	0	0	40	6	6	7	6	6	5	2	1	1	4	3	6

*Aurora recorded. —*

Where the class of aurora is aided by the observer, it is given I, II, III, IV, the IV, the best, the brilliancy.

3. St. Alban, II.
8. Pembina Crossing, II.; Rat Portage, I.
9. Minnedosa, I.; Georgetown, IV.; Emsdale, II.
13. Bowsman, IV.
28. Gravenhurst, IV.
29. Laidleybury, III.; Pembina Crossing, II.
30. Gravenhurst, IV.; Minnedosa, III.

*Thunder recorded. —*

1. Weyburn, Pembina Crossing, Stony Mountain, Ottawa, Rat Portage, Yorkton, Princeton, Oakdale Park.
2. Deltown, Port Stanley, Point Clark, Lucknow, Ridgetown, Owen Sound.
3. Sunshine, Dunnville, Lucknow, Hillview, Almasippi, Bowsman.
4. Deltown, Westport, London, Port Stanley, Port Plover, Dunnville, St. Catharines, Ridgetown.
5. Battleford, Orillia, Pelee, Ridgetown.
6. Regina, Georgetown, Wyoming, Midland, Lions Head, Warton, Port Hope, Westport, Scarborough, Sunshine, Aurora, Lindsay, London, Stratford, Qu'Appelle, Parry Sound, Port Stanley, Bloombfield, Azincourt, Meaford, Port Hope, Hamilton, Paris, Dunnville, Welland, Lucknow, Ridgetown, Peterboro, Erasmus, Burt, Rockford, Abernethy, Rocklyn, St. Catharines.
7. Jernyn, Wyoming, Arden, Deer Park, Morden, Minnedosa, Kingson, Port Stanley, Brandon, Almasippi, Oakbank.
8. Georgetown, Emsdale, Wooler, Providence Bay, Lions Head, Huntsville, Warton, Princeton, Union, Westport, Scarborough, Aurora, Lindsay, Gravenhurst, Hileybury, Parry Sound, Grand Manan, Pettrie, Bloomfield, Azincourt, Kimmount, Port Hope, Haliburton, Hamilton, Orillia, Orangeville, Erasmus, Uxbridge, Rocklyn.
9. St. Stephen, Orangeville, Arden, Sunshine, Chilliwack, Barkerville, Toronto, Ottawa, Peterboro, N. Nicomen.
10. Beaver Hills W., Kuper Island, Barkerville, Medicine Hat, Gray Hills, Crane Lake, Okanagan Mission, Vancouver, Garry Point.
11. Whitewood, Beaver Hills W., Greentell, Duck Lake.
13. Beaver Hills W., Broomhill, Kamloops, Cranbrook.
14. Broomhill, Threehills Creek, Pincher Creek.
15. Medicine Hat, Banff, Threehills Creek, Pincher Creek.
16. Dirt Hills.
17. Regina, Whitewood, Weyburn, Hillview, Pembina Crossing, Qu'Appelle, Almasippi, Pembina Crossing, Manor, Abernethy, Crescent Lake, Greentell, Gatesgarth, Alameda, French Creek.
18. Regina, Whitewood, Weyburn, Hillview, Stony Mountain, Qu'Appelle, Minnedosa, Winnipeg, Hillview, Almasippi, Oakbank, Abernethy, Crescent Lake, Alameda.
19. Regina, Weyburn, Dirt Hills, Wyoming, Midland, Westminster, Belmont, London, Pembina Crossing, Stratford, Stony Mountain, Swift Current, Minnedosa, Port Stanley, White River, Bruce Mines, Paris, Cockburn Island, Stony Creek, Welland, Lucknow, Ridgetown, Brantford, St. Albans, Hillview, Almasippi, Pembina, Alameda, Threehills Creek, Crescent Lake, Gatesgarth, Mooselaw.
20. Whitewood, Weyburn, Dirt Hills, Providence Bay, Lions Head, Port Burwell, Qu'Appelle, Minnedosa, Parry Sound, Port Stanley, Bruce Mines, Meaford, Hamilton, Crane Lake, Point Clark, Dunnville, Lucknow, Owen Sound, St. Albans, Hillview, Almasippi, Alameda, Mooselaw, Oakdale Park, Rocklyn.
21. Nottawasaga, Minnedosa, Cockburn Island.

22. Georgetown, Emsdale, Wyoming, Midland, Providence Bay, Wiarton, Princeton, Ursa, Searboro', Pembina Crossing, Aurora, Cayuga, Lindsay, Gravenhurst, London, Haileybury, Stratford, Barkerville, Toronto, Port Stanley, White River, Bissett, Bloomfield, Peterboro', Owen Sound, Erasmus, Brantford, Brome, Agincourt, Meaford, Kinnmount, Port Hope, Haliburton, Hamilton, Port Dover, Paris, Dunnville, Stony Creek, Uplands, Welland, Lucknow, Bala, Ridgetown, Uxbridge, Rocklyn.

23. Fredericton, Georgetown, Emsdale, Jernyn, Arden, Providence Bay, Lion's Head, Wiarton, Ursa, Westport, Searboro', Sunshine, Deer Park, Truro, Lindsay, Gravenhurst, Pietou, Haileybury, Stratford, Swift Current, Kingston, Port Stanley, White River, Ottawa, Quebec, St. John, Agincourt, Rat Portage, Kinnmount, Dalhousie Mills, Haliburton, Port Dover, Clontarf, Bala, Peterboro', Erasmus, Savanne, Abitibi, Uxbridge.

24. Emsdale, Jernyn, Midland, Arden, Lion's Head, Huntsville, Ursa, Searboro', Truro, Parry Sound, Kingston, Ottawa, Halifax, Haliburton, Uplands, Clontarf, Bala, Owen Sound, Brome.

25. Fredericton, Emsdale, Wyoming, Arden, Nottawasaga, Ursa, Westport, London, Parry Sound, Port Stanley, Bissett, Grand Manan, Kinnmount, Haliburton, Dunnville, Ridgetown.

26. Emsdale, Ursa, Lindsay, Gravenhurst, Nanaimo, Port Stanley, Bissett, Ottawa, Kinnmount, Haliburton, Orillia, Peterboro', Uxbridge.

27. Arden, Ursa, Chilliwack, Barkerville, New Westminster, Peterboro', Golden, Bullion, N. Nicomen, Revelstoke, Princeton, Vancouver.

28. Paris, Crescent Lake, Okanagan Mission, Tobacco Plains.

29. Broomhill, Lion's Head, Medicine Hat, Battleford, Qu'Appelle, Port Arthur, Meaford, Clontarf, Threehills Creek, Duck Lake, Crane Lake, Beaver Hills E.

30. Beaver Hills W., Swift Current, Hillview, Bowsman, Princeton.

*Appearance of Spring Birds, etc. :*

SWALLOWS—Pembina Crossing, 4th ; Ullswater, 27th ; Lucknow, 5th ; Golden, 9th ; N. Nicomen, 13th ; Calgary, 23rd ; Stirling, 1st.

CATBIRD—Meaford, 3rd ; Crescent Lake, 24th.

HUMMINGBIRD—Arden, 16th ; Beatrice, 18th.

KINGBIRD—Pembina Crossing, 13th.

ORIOLES—Searboro', 3rd ; Pembina Crossing, 13th ; Lucknow, 5th ; Meaford, 8th ; Bruce Mines, 20th ; Toronto, 4th.

BLUEBIRD—Pembina Crossing, 14th.

WILD PIGEONS—Westport reports flock of wild pigeons on 13th and 14th.

WHIP POOR-WILL—Norquay, 5th ; Pembina Crossing, 7th ; Toronto, 20th.

MEADOW LARKS—Beaver Hills W., 1st ; Victoria, Alt., 10th.

BOBOLINK—Pembina Crossing, 16th ; Crescent Lake, 19th.

THRUSHES—Ullswater, 24th.

BLACKBIRD—Ullswater, 24th ; Victoria, Alt., 2nd.

ROBINS—Oakbank, 12th ; Crane Lake, 1st.



## FORECASTS FOR MAY, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1048. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba .....	82	70	10	2	91.5
Lake Superior .....	110	86	15	9	85.0
Lower Lake Region .....	105	87	14	4	89.5
Georgian Bay .....	105	78	21	6	84.3
Ottawa Valley .....	104	74	22	8	82.7
Upper St. Lawrence .....	104	76	19	9	82.2
Lower St. Lawrence .....	101	77	18	6	85.1
Gulf .....	106	76	22	8	82.0
Maritime Provinces, West .....	115	86	21	8	83.9
Maritime Provinces, East .....	116	83	21	12	80.6
Total .....	1048	793	183	72	84.4

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

The forecasts and storm warnings were issued by Forecast Official, B. C. Webber.

R. F. STUPART,  
*Director.*

Meteorological Office, Toronto,  
26th June, 1902.



# METEOROLOGICAL SERVICE, DOMINION OF CANADA.

## Monthly Weather Review.

VOL. XXVI

JUNE, 1902.

No. 6

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### REMARKS UPON THE WEATHER.

The weather in British Columbia did not depart much from the normal excepting in a few localities. In Vancouver and other Islands the warmest periods were from the 18th to 22nd, and 26th to 30th, when the temperature exceeded 80° at many places. Over the Lower Mainland, although these periods were not so well marked, high temperatures generally prevailed. Over the Upper Mainland warm weather continued from the 18th to 23rd; also on the 28th and 29th. With these exceptions the fluctuations in temperature throughout the Province were comparatively unimportant. In Vancouver Island, showers were frequent in most districts, but from some places drought was reported. Over the mainland short periods of sunshine, followed by clouded sky and showers, were most regular, and vegetation, although suffering in a few districts from drought, was generally normal.

In the North-west Territories exceptionally dull, cool weather with much rain prevailed throughout the greater part of the month. Comparatively high temperatures were recorded from the 8th to 13th; also after the 21st, between 70 and 80 being reported generally. Although the rainfall exceeded the average, the excess was not very large, excepting in a few districts. Frosts were recorded at many places, and did some damage to tender plants. Vegetation was backward throughout the Territories, but more especially in the western portion.

The weather conditions in Manitoba were similar to conditions in the Territories, low temperatures, clouded skies and frequent falls of rain being general. Although the days were comparatively warm the nights were generally cool, frosts being recorded at some places late in the month. Low lands were flooded in some districts, and although vegetation was luxuriant, it was backward.

In Ontario the weather was most exceptionally cool, cloudy and wet, fresh or strong winds from a northerly direction also being most frequent and persistent. Warm weather occurred about the 14th, 15th and the 19th, when temperatures between 80° and 90° were recorded. After the 26th, the weather became drier and more settled, but continued cool to the last day. Frosts were reported from many places, but not much damage was caused thereby, and vegetation was somewhat backward on the 30th.

In the Province of Quebec the weather conditions were quite similar to conditions in Ontario, dull, cool weather, with frequent falls of rain being general throughout the month. During the first three days, also about the 14th, 15th and 16th, comparatively warm weather occurred, the temperature rising to 80°, or nearly so at many places. Frosts were recorded at a few places, and owing doubtless to the persistent low temperatures vegetation was quite backward.

In New Brunswick the weather was also characterized by low temperatures, much rain and clouded skies, there being no well marked, dry, warm period during the month. High temperatures occurred on or about the 2nd, when 80° was somewhat exceeded in many districts. Frosts occurred at many places, causing some damage, and the condition of vegetation on the 30th was not very promising.

The weather in Nova Scotia, as in other portions of the country, was generally cool, cloudy and wet, the maximum temperatures nowhere exceeding 80°, and this quantity only being reached at two stations. A gale was recorded at Halifax on the 26th, when a wind velocity of thirty five miles per hour was registered. Frosts occurred at a few places, but no damage to plant life was reported. Vegetation was generally backward.

In Prince Edward Island cool, cloudy weather, with frequent showers, was general. With the exception of a comparatively dry period from the 6th to 16th, rain fell nearly every day. The maximum temperature nowhere reached 80°, but the lowest reported was 36·6, and although vegetation was backward it was not quite so much so as in other provinces.—F. F. PAYNE.

#### ATMOSPHERIC PRESSURE.

Atmospheric pressure ranged from the average amount in New Ontario to 0·16 of an inch below in Newfoundland, the negative departures increasing gradually from west to east. In Manitoba, the North-west Territories, and in Northern and Eastern British Columbia, there was a positive departure of from 0·01 to 0·10 of an inch, the maximum amount occurring in northern localities, whereas elsewhere in British Columbia pressure was from average to 0·02 of an inch below.

#### HIGH AREAS.

Eight areas of high pressure were charted during the month, the majority being of feeble energy. In the North-west Territories and Manitoba rain and snow accompanied several of the areas, and frost attended No. 7 in Alberta.

No. 1 moved into Saskatchewan during the 3rd, and thence eastward, north of the Lake Region to Labrador. Local snowfalls occurred in the North-west Territories, and showers in Manitoba during its presence, and local frosts were experienced in the North-west Territories, New Ontario and Northern Quebec. No. 2 had a very slight effect on Canadian weather, except that it was attended by showers and local frosts in the North-west Territories on the 7th. It took a south-easterly course during the 9th. Nos. 3, 4 and 5 were very feeble areas which formed over Manitoba and the Dakotas during the 9th to 12th, and moved eastward to Quebec, where they dispersed. No. 6 formed over Montana on the 15th, and pursued a south-easterly course to the New Jersey Coast. No. 7 moved over British Columbia and Alberta during the 18th and 19th, thence moving south-eastward to the Carolina Coast. It was attended by local snow and frosts in Alberta during the 18th and 19th. No. 8 was observed over Saskatchewan on the 24th, and moved slowly eastward north of Lake Superior and dispersed. During its presence there were showers in the North-west Territories.

#### LOW AREAS.

Fourteen areas of depression were charted during the month, the largest number in June since the inception of the Canadian Meteorological Service. Many of the depressions were very energetic, and nearly the whole number were attended by copious and widespread rain areas.

No. 1 was centred in Wyoming the morning of the 1st; it reached Manitoba on the 2nd, and it passed out of the range of observation by the night of the 3rd. It was accompanied by heavy rains from the Rockies to Lake Superior, turning locally in Alberta and Saskatchewan to sleet and snow. No. 2 was subsidiary to No. 1, and travelled from Nebraska to the Maritime Provinces between the 2nd and the 4th, its path being over the Lake Region and the Upper St. Lawrence Valley. It caused copious rains from Ontario to our Atlantic Coast, as well as very strong easterly winds in the Lower St. Lawrence Valley. No. 3 was first shown in Lower California on the 3rd, and moving slowly north eastward, it reached Ontario during the night of the 6th, the Maritime Provinces on the 8th, and on the 9th, it passed into the Gulf of St. Lawrence. Its accompanying rain area was pronounced, and during its presence a considerable quantity of precipitation was experienced in Canada eastward from the Rocky Mountains, especially in Ontario, Quebec and the Maritime Provinces. No. 4 travelled from Northern Alberta to Wisconsin between the 8th and 9th, and then dispersed. It was attended by a few scattered showers and thunderstorms only. No. 5 skirted the Lower St. Lawrence Valley on the 10th, and then passed into the Straits of Belle Isle. It was a rather energetic area and drew very strong winds over the Gulf and Maritime Provinces, accompanied by heavy rainfalls. No. 6 was situated in Southern Alberta on the evening of the 9th, and travelling in an east-south-easterly direction it passed over the Lake Region during the 11th, and reached the Maritime Provinces on the 12th. Its accompanying showers although widely experienced, were nowhere very heavy. No. 7 was no doubt of tropical origin, first appearing, as it did, on the 11th to the southward of Cuba. Its course was over Western Florida and the South Atlantic States to Virginia, thence up the Seaboard to the Maritime Provinces, where, on the 17th, it became emerged in No. 8. Its influence did not extend to any marked extent into Canada, except that it probably augmented the rainfall accompanying No. 8 in the Eastern and Maritime Provinces. No. 8 passed from the Middle Pacific States to Manitoba between the 12th and 14th, thence over the Lake Region and the Ottawa and St. Lawrence Valleys, reaching the Maritime Provinces on the 17th. It was attended by a considerable rainfall in nearly all parts of Canada east of the Rocky Mountains, the most general, heavy precipitation occurring in Eastern Quebec and the Maritime Provinces. No. 9—The path of this area was somewhat doubtful. On the 16th the area was situated in Montana, and on the 17th in Manitoba. It then passed out of the range of

observation, but on the 19th it apparently moved southward into the Lower St. Lawrence and the Maritime Provinces, where it afterwards dispersed. Excessive rainfalls marked its presence over a large portion of the North-west Territories and in Manitoba, the winds at the same time increasing to heavy gales over the latter Province. Subsequently there were local showers in Ontario, Quebec and the Maritime Provinces, but no heavy rainfalls. No. 10 moved into the Lower Lake Region on the 21st from the Middle Mississippi Valley, thence over the Ottawa and St. Lawrence Valleys and into the Gulf. It was an energetic area, bringing heavy rain from Ontario to the Maritime Provinces, especially in the latter Provinces, and at the same time very strong winds prevailed, attaining to the force of a moderate gale in the Lower St. Lawrence Valley and the Gulf. No. 11 was first defined on the 23rd in the vicinities of Idaho and Utah. After traversing the Western States it moved into the Lower Lake Region during the 25th, and between the 26th and 27th it passed over the Ottawa and St. Lawrence Valleys and the Maritime Provinces. It was a most energetic area, unusually so for the season of the year, a second marked foci being in evidence on the Connecticut Coast during its eastward advance. Excessive rainfalls marked the path of the system from Ontario to the Maritime Provinces, together with a gale of much severity in nearly all localities; further, the numerous rains and heavy local storms which prevailed in British Columbia, the Territories and Manitoba, between the 23rd and 24th, were, no doubt, closely allied with this system. No. 12 was situated in Texas on the 27th, skirted the south shores of the Lower Lake Region on the 29th, and then moved off the Middle Atlantic Coast. It was another area of considerable energy, but its accompanying gales and rainfall did not extend into Canada outside of Lakes Erie and Ontario and their environments. No. 13 took very much the same course as its predecessor and skirted the Lower Lakes on the 30th. It was of moderate energy, but attended by a pronounced and widespread rain area. No. 14 was a shallow area which moved into the North-west Territories and Manitoba between the 28th and 30th, continuing the prevailing unsettled and showery weather.

#### BRIGHT SUNSHINE.

The mean proportion of bright sunshine was much below the average in Canada, except at Battleford, N.W.T., and Victoria, B.C., where there was a slight excess.

The deficiency ranged from 3 per cent at Agassiz to 20 per cent at Lindsay.

#### WINDS.

On Vancouver Island and the Lower Mainland the westerly direction more generally prevailed than any other. No gales were experienced, but fresh breezes were recorded on eighteen days, attaining on several other occasions to the force of a strong breeze.

In the North-west Territories there were many north and east winds, but the general direction was variable. Twenty days the force of a fresh breeze was attained, and on four days that of a strong breeze.

In Manitoba the north and east direction was also in evidence. There were seventeen days with fresh or strong breezes, besides two gales, the storm of the 17th and 18th being particularly heavy.

In the Lake Region the general direction was westerly on fifteen days, easterly on nine, and at other times variable. There were nineteen days with fresh or strong breezes, and the force of a gale was reached between the 25th and 26th, and again on the 29th.

In the Ottawa and St. Lawrence Valleys the westerly direction predominated. Fresh or strong breezes prevailed on nineteen days, and a gale was recorded on the 25th.

In the Gulf of St. Lawrence the direction was variable, favouring somewhat the easterly. Fresh or strong breezes were recorded on twenty days, and the force of a gale on the 9th, 21st, 26th and 27th.

In the Maritime Provinces the westerly direction obtained on fifteen days, and at other times the winds were very variable. Fresh to strong breezes were recorded on twenty-three days, and the force of a gale on the 26th.

The gales were all successfully warned except the storm which occurred in the Gulf of St. Lawrence on the 9th, which was not warned.

#### TEMPERATURE.

Vancouver Island was the only part of the Dominion where the mean temperature of June was as high as the average. In the North-west Territories and Manitoba the negative departures ranged between 5 and 8, and in Ontario, Quebec and the Maritime Provinces between 2 and 5. A negative departure of about 5 in Alberta diminished westward to 3 at Kamloops, and to nil at the Straits of Georgia, and a slight positive departure occurred at Victoria.

*The Highest and Lowest temperatures in each Province during June, 1902, were :*

British Columbia,	89°·0 on 21st at Agassiz,	24°·0 on 19th at Revelstoke.
	89°·0 on 30th at Glacier,	
North-west Territories,	87°·0 on 8th at Chaplin,	20°·0 on 15th at Athabasca Landing
Manitoba,	83°·0 on 2nd at Treherne,	34°·0 on 19th at Treherne.
Ontario,	88°·0 on 2nd at St. Catharines,	23°·0 on 8th at Savaune.
Quebec,	83°·6 on 2nd at Chicoutimi,	28°·0 on 6th at Father Point.
New Brunswick,	81°·7 on 2nd at Fredericton,	34°·0 on 7th at Sussex.
Nova Scotia,	80°·0 on 19th at Halifax,	30°·0 on 1st at Truro.
	80°·0 on 21st at Bridgetown,	
Prince Edward Island,	78°·6 on 2nd at Charlottetown,	36°·6 on 7th at Summerside.

#### PRECIPITATION.

In nearly all parts of the Dominion the June rainfall was in excess of the average ; in Quebec, Northern New Brunswick and Manitoba, except near Winnipeg, it was from one-third greater to double the average, and the same is true over a large portion of Ontario, especially in the south and south-west districts. In the more central parts of Alberta, as in May, the rainfall has been phenomenal, Calgary reporting four times the average amount : this extreme excess did not, however, extend north of Wetaskiwin, and in the neighbourhood of Edmonton and Battleford there was even a deficiency. In the Upper Mainland of British Columbia there was an excess, but in the Lower Mainland a deficiency, which was even more pronounced in Vancouver Island







ONTARIO.—*Con.*

Saunders	44 30	81 21	655	29 89	30 25	29 29	1 00	57 5	3 26	52 0	30 1	9 18 3	.....	6	2	84	17	45	45	85	148	123	152	13	720	8 8	17 0	9 SW	3 40	1 0	0 78	17 11	0 0	3	
Owen Sound	44 34	80 55	597	.....	.....	.....	.....	50 3	3 52	80 6	30 0	9 30 5	.....	.....	.....	0	15	0	1	9	53	8	17	1	90	.....	.....	.....	4 42	1 57	0 77	19 10	0 0	3	
Uplands	45 48	79 25	.....	.....	.....	.....	.....	50 3	4 15	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Toronto	43 40	79 24	350	29 89	30 31	29 35	0 96	59 4	3 26	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Welland	42 59	79 17	722	29 89	30 31	29 35	0 96	62 1	3 26	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Peterborough	44 17	78 15	722	29 89	30 31	29 35	0 96	58 6	3 26	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Leeds	44 20	78 45	872	29 89	30 31	29 35	0 96	58 6	3 26	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Deerfield	44 21	77 4	264	.....	.....	.....	.....	60 1	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Lakeland	44 25	77 15	.....	.....	.....	.....	.....	58 6	3 26	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Kingsdown	44 30	81 55	285	29 85	30 34	29 38 1 01	.....	58 9	3 26	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Clontarf	45 25	77 42	294	29 87	30 40	29 24 1 16	.....	58 4	3 26	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Ottawa	45 25	77 42	294	29 87	30 40	29 24 1 16	.....	60 6	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Bassett	46 9	78 6	552	29 86	30 34	29 37 1 07	.....	57 0	4 4	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Carter	46 40	80 50	.....	.....	.....	.....	.....	60 6	4 4	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Sarnia	42 59	82 24	586	29 91	30 26	29 29 0 97	.....	60 6	4 4	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Stratford	42 59	81 0	1191	29 91	30 26	29 29 0 97	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Lacknow	43 55	81 30	1252	29 87	30 29	29 41 0 78	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
White River	48 35	81 16	1252	29 87	30 29	29 41 0 78	.....	51 2	3 26	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Port Arthur	48 27	80 12	644	29 89	30 21	29 53 0 71	.....	52 6	3 26	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Stony Creek	48 13	79 18	292	.....	.....	.....	.....	60 1	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Glenora	44 20	83 4	1250	29 85	30 34	29 38 1 01	.....	60 1	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Windsor	42 20	83 4	1250	29 85	30 34	29 38 1 01	.....	60 1	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Alton	43 53	80 5	1250	29 91	30 26	29 29 0 97	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Guelph	43 53	80 16	.....	.....	.....	.....	.....	58 3	5 1	83 6	16	35 0	9 21 0	.....	.....	1	4	0	4	2	3	10	5	0	90	.....	.....	.....	4 36	0 40	1 21	17	0 0	1	
North Bruce	44 23	81 25	.....	.....	.....	.....	.....	55 4	7 10	80 0	3	42 0	9 15 9	.....	.....	3	1	7	6	15	24	26	1	0	90	.....	.....	.....	3 73	1 62	0 40	15	0 0	5	
Collingwood	44 30	80 15	.....	.....	.....	.....	.....	54 9	7 10	80 0	3	42 0	9 15 9	.....	.....	3	1	7	6	15	24	26	1	0	90	.....	.....	.....	3 73	1 62	0 40	15	0 0	5	
Rocklyn	44 28	80 30	1339	29 85	30 34	29 38 1 01	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Rocklyn	44 28	80 30	1339	29 85	30 34	29 38 1 01	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Whitby	44 28	80 30	1339	29 85	30 34	29 38 1 01	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Orillia	44 34	79 34	.....	.....	.....	.....	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Collingwood	44 34	79 34	.....	.....	.....	.....	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Beattie	45 8	79 29	770	29 85	30 34	29 38 1 01	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Gravenhurst	45 8	79 29	770	29 85	30 34	29 38 1 01	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
Halliburton	45 1	78 28	.....	.....	.....	.....	.....	57 5	3 0	26 83 0	14	39 0	4 21 6	.....	.....	42	4	5	4	23	8	0	4	0	90	.....	.....	.....	3 65	0 24	0 73	59	0 0	2	
Point Clark	44 5	81 14	595	29 92	30 33	29 45 0 90	.....	57 5	3 0	26 83 0	14	39 0	4 21 6	.....	.....	42	4	5	4	23	8	0	4	0	90	.....	.....	.....	3 65	0 24	0 73	59	0 0	2	
Brimm	43 2	81 56	.....	.....	.....	.....	.....	58 5	4 19	81 6	13	11 30 5	.....	.....	.....	2	32	63	145	15	47	249	99	12	720	10 2	18 5	26 W	3 83	0 19	0 71	17 13	0 0	2	
London	42 59	81 13	808	29 92	30 26	29 29 0 97	.....	60 3	0 2	19 52 5	14	31 5	9 19 4	.....	.....	1	9	0	0	2	0	55	12	32	0	90	.....	.....	.....	4 23	1 08	0 71	17	0 0	0
Port Stanley	42 40	81 13	592	29 91	30 27	29 32 0 94	.....	59 9	4 1	28 7 2	19	36 7	9 17 8	.....	.....	3	32	17	145	45	41	108	260	43	23	720	8 5	18 0	20 E	5 45	0 90	27	15	0 0	0
Woodstock	43 8	80 47	980	29 92	30 33	29 45 0 90	.....	59 6	4 1	28 7 2	19	36 7	9 17 8	.....	.....	3	32	17	145	45	41	108	260	43	23	720	8 5	18 0	20 E	5 45	0 90	27	15	0 0	0
Port Dover	42 47	80 13	635	.....	.....	.....	.....	61 8	5	5 26 84 3	15	28 0	9 19 8	.....	.....	9	9	7	75	29	64	115	162	110	62	720	8 5	18 0	20 E	5 45	0 90	27	15	0 0	0
Pelee Island	41 50	82 38	.....	.....	.....	.....	.....	60 3	5	5 26 84 3	15	28 0	9 19 8	.....	.....	9	9	7	75	29	64	115	162	110	62	720	8 5	18 0	20 E	5 45	0 90	27	15	0 0	0
Paris	43 12	80 25	840	29 85	30 34	29 38 1 01	.....	60 3	5	5 26 84 3	15	28 0	9 19 8	.....	.....	9	9	7	75	29	64	115	162	110	62	720	8 5	18 0	20 E	5 45	0 90	27	15	0 0	0
St. Mary's	43 15	81 11	1040	29 85	30 34	29 38 1 01	.....	60 3	5	5 26 84 3	15	28 0	9 19 8	.....	.....	9	9	7	75	29	64	115	162	110	62	720	8 5	18 0	20 E	5 45	0 90</				

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JUNE, 1902.

[illegible]

# PRECIPITATIONS AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING JUNE, 1902.

STATIONS.	RAINFALL.				REMARKS.
	Amount in inches.	No. of Days of or Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.
	in.			in.	
<b>BRITISH COLUMBIA—</b>					
Coquitlam .....	2 15	10	20	0 71	24
Nanaimo .....	1 30	9	21	0 45	3
Royal Oak .....	0 30	6	24	0 12	23
Caulfields .....	3 81	7	21	2 76	2
Kuper Island .....	1 24	12	18	0 25	3
Goldstream Lake .....	0 80	10	20	0 22	5
Naas Harbour .....	2 55	17	13	0 42	8
Port Essington .....	4 25	12	18	1 29	9
					Hail 3rd.
					Thunder on 13th and 15th.
					Unusually dry month in this part of B. C.
<b>N. W. TERRITORIES—</b>					
Regina .....	3 69	12	18	0 76	1
Beaver Hills, N.E. ....	1 26				
Calgary .....	9 66	22	8	1 75	3
Beaver Hills, W. ....	2 10	16	14	0 73	9
Whitewood .....	5 64	10	20	1 56	16
Stirling .....	6 60	9	21	2 56	2
Dirt Hills .....	7 18	15	15	1 44	16
Salteoats .....	5 15	11	19	1 34	14
Coutts .....	7 53	10	20	2 08	2
Innisfail .....	4 96	13	17	0 99	24
Northern .....	1 86	8	22	0 70	1
Weyburn .....	8 10	15	15	3 95	16
					Thunderstorm on 1st; frost on 19th.
					Thunder on 8th; frost on 18th.
					1st, fall of snow; 18th, 2½ in. of snow.
					2nd, fall of snow; 8th, thunder; 9th, thunder.
					Thunder on 1st and 8th; 9th roses in bloom.
					Thunder on 1st, 2nd, 4th, 5th, 11th, 16th and 30th.
					1st, 1 in. of wet snow.
					1st, snow; 9th, hailstorm.
					1st, snow; 11th, thunder; frost 18th, 19th and 20th.
					Thunder 1st, 2nd, 16th, 17th.
<b>MANITOBA—</b>					
Norquay .....	3 99	14	15	0 60	15
Oakdale Park .....	4 21	14	16	1 76	16
Cartwright .....	2 92	12	18	0 87	16
Oak Lake .....	4 12	8	22	1 53	17
Belmont .....	4 00	13	17	1 21	17
Morden .....	3 96	10	27	1 38	14
Beaver .....	4 08	10	20	1 34	15
					19th, frost; 21st, fruit, potatoes and corn cut.
					Thunder 1st, 4th, 11th.
<b>ONTARIO—</b>					
Port Burwell .....	5 41	15	15	1 23	13
Glen Elm .....	4 59	12	18	1 03	16
Wooler .....	3 94	10	20	0 80	25
Scarboro' .....	3 83	12	17	1 09	25
					13th, fearful thunderstorm.
					10th, frost.
					Thunder 3rd, 24th; frost 6th, 11th.
					Frost 7th, 8th; thunder 2nd, 6th, 16th, 24th and 25th.
Missanabie .....	1 60	9	21	0 30	5
Aurora .....	2 14	11	19	0 63	25
Princeton .....	4 21	12	18	1 25	25
Providence Bay .....	3 21	11	19	0 88	25
Cayuga .....	4 36	11	11	0 73	25
Midland .....	3 46	13	17	1 02	25
Lansdowne .....	4 80	9	20	1 31	21
Lynedoch .....	4 48	11	19	1 53	13
Georgetown .....	3 58	14	10	0 85	25
Arden .....	4 02	18	12	0 96	17
					Thunder on 7th, 12th, 15th, 16th, 24th.
					Thunder on 4th, 8th, 16th, 25th; frost 9th and 11th.
					Thunder 3rd, 16th, 25th.
Jernyn .....	2 90	9	21	0 60	26
Croydon .....	3 38	9	21	0 80	26
Wyoming .....	5 45	16	14	1 10	7
Parma .....	3 22	7	23	0 85	26
Watford .....	4 80	11	19	0 92	6
Oliver's Ferry .....	3 29	9	21	0 89	16
Orangeville .....	3 81	13	17	1 00	26
Sunshine .....	3 06	16	14	0 80	26
Westminster .....	4 64	14	16	0 93	30
Lion's Head .....	3 45	12	18	0 98	25
Dealtown .....	6 22	15	14	1 30	29
Ensdale .....	4 77	20	10	1 00	26
Westport .....	4 60	16	14	1 31	16
Montague .....	4 25	7	23	1 17	3
Newburgh .....	2 23	6	24	0 47	8
Emmimore .....	2 90	5	25	1 00	16
Warton .....	3 80	11	19	1 03	25
Goderich .....	2 24	10	20	0 50	20
Huntville .....	3 91	10	20	0 82	26
Ursa .....	4 74	18	12	0 62	25
Nottawasaga .....	3 30	10	20	0 80	25
Uxbridge .....	2 06	10	20	0 50	25
Deer Park .....	2 94	8	22	1 05	26
					Thunder 1st, 3rd, 9th, 13th.
					23rd, hail and thunder.
					Thunder 2nd, 3rd, 14th, 20th, 24th; 8th, frost.
					Thunder 1st, 2nd.
<b>NEW BRUNSWICK—</b>					
Point Escomiac .....	5 61	14	16	1 87	26
<b>NOVA SCOTIA—</b>					
Port Morien .....	4 19	9	21	1 30	23

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF JUNE, 1902.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria	0 00	0 14	0 32	0 41	0 46	0 49	0 64	0 66	0 73	0 71	0 66	0 62	0 52	0 42	0 28	T
Nanaimo	0 11	0 29	0 41	0 38	0 48	0 55	0 52	0 62	0 58	0 59	0 56	0 62	0 60	0 51	0 42	0 16
Agassiz	0 00	0 00	0 12	0 27	0 34	0 30	0 43	0 12	0 51	0 56	0 46	0 42	0 39	0 28	0 17	0 01
Battleford	0 46	0 53	0 54	0 58	0 61	0 60	0 57	0 55	0 53	0 53	0 53	0 51	0 53	0 52	0 34	0 14
Indian Head	0 00	0 00	0 00	0 28	0 46	0 51	0 54	0 58	0 57	0 47	0 46	0 35	0 34	0 34	0 34	0 17
Brandon	0 03	0 32	0 34	0 49	0 52	0 55	0 64	0 65	0 62	0 57	0 62	0 49	0 51	0 47	0 04	0 00
Winnipeg	0 19	0 21	0 39	0 49	0 52	0 51	0 59	0 62	0 61	0 64	0 64	0 62	0 55	0 45	0 37	0 15
Woodstock	0 00	0 15	0 33	0 39	0 40	0 52	0 57	0 54	0 55	0 60	0 62	0 64	0 65	0 60	0 46	0 14
Toronto	0 00	0 26	0 53	0 51	0 51	0 54	0 55	0 55	0 49	0 51	0 57	0 62	0 65	0 60	0 44	0 03
Lindsay	0 01	0 07	0 18	0 35	0 36	0 40	0 43	0 47	0 45	0 55	0 55	0 59	0 41	0 34	0 22	0 08
Gravenhurst	0 00	0 11	0 33	0 34	0 42	0 48	0 52	0 52	0 53	0 61	0 65	0 68	0 60	0 66	0 46	0 33
Barrie																
Kingston	0 00	0 10	0 43	0 45	0 47	0 48	0 51	0 50	0 47	0 53	0 50	0 58	0 53	0 43	0 41	0 00
Ottawa	0 00	0 26	0 43	0 41	0 41	0 43	0 43	0 47	0 46	0 43	0 51	0 56	0 52	0 46	0 38	0 00
Montreal	0 03	0 38	0 46	0 49	0 50	0 49	0 43	0 48	0 51	0 49	0 45	0 47	0 40	0 40	0 09	0 00
Fredericton	0 34	0 47	0 49	0 52	0 56	0 53	0 60	0 56	0 50	0 49	0 40	0 38	0 35	0 26	0 06	0 00

	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Gravenhurst.	Barrie.	Kingston.	Ottawa.	Montreal.	Fredericton.
Mean proportion for month. (Constant sunshine being 1.)	0 44	0 46	0 29	0 52	0 34	0 42	0 47	0 46	0 48	0 35	0 46		0 42	0 40	0 44	0 42
Difference from average	0 06	—	0 03	0 02	0 09	0 04	0 06	0 07	0 09	0 20	—		0 12	0 13	0 10	0 06
Maximum daily amount	0 86	0 95	0 75	0 97	0 75	0 81	0 91	0 88	0 92	0 97	0 86		0 86	0 89	0 98	0 92
Date	18	19	5	21	23	8	21	5	5	17	19		17	5	5	1
No. of days completely clouded	3	2	7	2	9	2	2	0	1	2	0		2	1	5	6

*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

5. Emsdale, IV.
8. Pembina Crossing, IV ; Emsdale, IV.
29. Quebec, IV.
30. Pembina Crossing, IV.

*Thunder recorded on :—*

1. Hamilton, P.E.I., Pembina Crossing, Minnedosa, Swift Current, Treherne, Hillview, Oakbank, Almasippi, Moose Jaw, Crane Lake, Alameda, Orillia, Midland, Wiarton, Regina, Whitewood, Dirt Hills, Oakdale Park, Belmont, Weyburn, Barnardo.

2. Moncton, St. Stephen, Sussex, Summerside, Erasmus, Brantford, Lucknow, Port Stanley, Quebec, Pembina Crossing, Stony Mountain, Pictou, Parry Sound, Port Arthur, Winnipeg, N. Nicomen, Owen Sound, Lakefield, Bala, Kinmount, Uplands, Orillia, Ridgetown, Scarboro', Aurora, Midland, Georgetown, Wyoming, Emsdale, Ursa, Beatrice, Haliburton, Meaford, Cockburn Island, Agincourt, Rat Portage, Broomhill, Dirt Hills, Wiarton, Toronto, Gravenhurst, Stratford, Charlottetown, Truro.

3. Brantford, Port Stanley, Chilliwack, Stony Mountain, Lindsay, Port Arthur, Oakbank, Bullion, Stony Creek, Owen Sound, Lakefield, Clontarf, Peterboro', Rocklyn, Bala, Hamilton, Wooler, Midland, Jermyn, Lion's Head, Westport, Ursa, Broomhill, Guelph, Grand Manan.

4. Pictou, Ottawa, Swift Current, Treherne, Hillview, Aweine, Almasippi, Alameda, Princeton, N. Nicomen, Owen Sound, Arden, Broomhill, Oakdale Park, Belmont, New Westminster.

5. Vancouver, Dirt Hills.

6. London, Threehills Creek, Clontarf, Port Dover, Scarboro', Wyoming.

7. Brantford, Medicine Hat, Aurora, Georgetown, Dealtown, Stratford.

8. Bon Accord, Rat Portage, Beaver Hills W., Whitewood.

9. Minnedosa, Port Arthur, Hillview, Duck Lake, Kneehill, Gray Hill, Threehills Creek, Bullion, Beaver Hills W.

10. Stony Mountain, Swift Current, Medicine Hat, Oakbank, Channel Island, Duck Lake, Kneehill, Crane Lake, Threehills Creek, Rat Portage, Beaver Hills W., Saltcoats, Barnardo.

11. Port Stanley, Minnedosa, Swift Current, Winnipeg, Athabasca Landing, Hillview, Channel Island, Bon Accord, Crane Lake, Dirt Hills, Northern.

12. Erasmus, Brantford, Welland, Lucknow, London, Stony Creek, N. Bruce, Hamilton, Port Dover, Paris, Dunnville, Ridgetown, Princeton, Georgetown, Wyoming, Oakdale Park, Toronto, Stratford.

13. Port Stanley, Nanaimo, London, Pincher Creek, Cranbrook, Point Clark, Port Burwell, Sunshine, Naas Harbour, Macleod.

14. Erasmus, Hillview, Threehills Creek, N. Bruce, Bruce Mines, Hamilton, Port Dover, Paris, Point Clark, Ursa, Broomhill, Stratford.

15. Lucknow, Port Stanley, Banff, Medicine Hat, Kingston, Crane Lake, Revelstoke, Port Dover, Paris, Orillia, Cockburn Island, Agincourt, Ridgetown, Princeton, Georgetown, Wyoming, Broomhill, Naas Harbour, Toronto, Stratford.

16. Port Stanley, Pembina Crossing, Stony Mountain, Lindsay, Medicine Hat, Treherne, Almasippi, Crane Lake, Okanagan Mission, Clontarf, Kinmount, Meaford, Scarboro', Georgetown, Arden, Jermyn, Sunshine, Westport, Ursa, Dirt Hills, Morden, Weyburn, Father Point.

17. Winnipeg, Almasippi, Pincher Creek, Arden, Belmont, Weyburn, Yarmouth.

18. Lucknow, Stony Mountain, Oakbank, Gray Hill, N. Nicomen, Bruce Mines.

19. Minnedosa, Gatesgarth, N. Bruce, Sunshine.

20. Sussex, Lakefield, Ursa.

22. Broomhill, Prince Albert.

23. Summerside, Port Stanley, Bowsman, Pincher Creek, Abernethy, Cranbrook, West Kootenay, Broomhill, Macleod.

24. Summerside, Percé, Welland, Port Stanley, London, Pictou, Port Arthur, Medicine Hat, Uplands, Oakbank, Stony Creek, Owen Sound, Clontarf, N. Bruce, Hamilton, Haliburton, Agincourt, Rat Portage, St. Catharines, Scarboro', Georgetown, Emsdale, Westport, Montague, Wiarton, Huntsville, Ursa, Toronto.

25. Summerside, Welland, Port Stanley, London, Pictou, Orillia, Dunnville, Scarboro', Princeton, Arden, Jermyn, Wolfville.

26. Bowsman, Okanagan Mission.

27. Almasippi, Bon Accord.

28. Bowsman.

29. London, Banff, Bowsman, Broomhill, Prince Albert.

30. Swift Current, Manor, Glacier.

#### FORECASTS FOR JUNE, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1,086. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	87	66	18	3	86.2
Lake Superior.....	111	73	27	11	77.9
Lower Lake Region.....	123	102	20	1	91.0
Georgian Bay.....	123	100	17	6	88.2
Ottawa Valley.....	107	86	12	9	86.0
Upper St. Lawrence.....	107	81	19	7	83.6
Lower St. Lawrence.....	102	83	14	5	88.2
Gulf.....	105	85	16	4	89.5
Maritime Provinces, West.....	111	85	19	7	85.1
Maritime Provinces, East.....	110	83	20	7	84.5
Total.....	1,086	844	182	60	86.1

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,

Meteorological Office, Toronto,  
26th July, 1902.

*Director.*

# METEOROLOGICAL SERVICE, DOMINION OF CANADA.

## Monthly Weather Review.

VOL. XXVI

JULY, 1902.

No. 7

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### REMARKS UPON THE WEATHER.

Over the islands of British Columbia there was much fine bright weather, and the showers which fell generally during the first five days, also on or about the 14th, 21st and last three days of the month, were mostly light. Over the Lower Mainland rain was frequent up to the 15th, after which fine weather prevailed in most districts to the 28th, when it became again unsettled. Over the Upper Mainland the weather was showery during the first four days, after which it cleared and continued fine to the 11th when showers again occurred on several days. On or about the 18th fine weather set in and continued to the 30th. High winds were rather frequent throughout British Columbia, and some damage was caused by heavy rains, but vegetation which made great progress after the 15th, was in excellent condition on the 31st.

During the first eight or nine days frequent and heavy rains occurred in Alberta, more especially in the southern portion; but after the 9th, with the exception of showers on or about the 16th, 24th and 30th, the weather was mostly fine, the sunshine for the month exceeding the average throughout the Territories. In Assiniboia and Saskatchewan, the dates upon which rain occurred corresponded nearly with those in Alberta, but the quantity was much less and the intervening periods were exceedingly fine. In the western portion of the Territories there was much cool weather, more especially at night, but elsewhere the mean temperature did not depart much from the normal. Vegetation, though somewhat backward, was luxuriant and in good condition on the 31st.

In Manitoba fine warm dry weather prevailed throughout the greater portion of the month, the occurrence of showers being well distributed with regard to dates, but the quantity was generally less after the 16th. The night temperatures were in most districts higher than in the Territories, and 90° was exceeded on some days during the month. Vegetation made rapid progress, and its condition was everywhere above the average.

The weather in Ontario was characterized by much cloudiness and rain, also frequent and destructive thunderstorms. Somewhat high mean temperatures occurred in a few districts contiguous to Muskoka and westward to Manitoba. In other portions of the province the temperature did not depart much from the normal. Dry periods were general from the 10th to 13th, and 28th to 31st, but with these exceptions rain fell in many places almost daily. At Chesterville and vicinity, in the County of Dundas, on the 17th, a tornado caused the loss of several lives and was exceedingly destructive. Vegetation which is usually brown and scorched in July was green and luxuriant, and where not damaged by heavy rains in excellent condition.

In the Province of Quebec the weather was cooler and drier than in Ontario, and after the 23rd it was fine and warm. In western districts there was much fine weather throughout the month, and the rainfall was lighter than elsewhere. In the vicinity of Quebec a heavy hailstorm occurred on the 8th, doing much damage. Vegetation was somewhat backward and was only fair on the 31st.

In New Brunswick the weather was unusually fine and dry, but somewhat cooler than usual in many places. Most of the rain recorded, occurred during the first half of the month, there being little after the 14th. Several heavy thunderstorms passed over the province, causing damage by lightning and hail. On or about the 6th or 7th temperatures below 40° were recorded in some districts. Vegetation, though backward, was in fair condition.

The weather in Nova Scotia was mostly fair and cool, periods of fine weather occurring from the 5th to 7th, 11th to 15th, and 28th to 31st. Light rainfall everywhere, excepting in the extreme southern portion, was also characteristic of the month. Frequent fogs were reported along the coast. Plant life was somewhat backward.

In Prince Edward Island the weather was exceptionally dry and cool, and in most localities there was much bright sunshine. The chief fine weather periods were from the 5th to 8th, 18th to 21st, and 24th to 31st. Temperatures well below 40° were recorded at some places on or about the 7th. Vegetation though suffering in some districts from drouth was normal.—F. F. PAYNE.

#### ATMOSPHERIC PRESSURE.

Atmospheric pressure was .05 of an inch above the average amount in North-western British Columbia, the Ottawa Valley, and in a portion of the St. Lawrence Valley, elsewhere in the Dominion the departures were exceedingly small, the average obtaining approximately.

#### HIGH AREAS.

Six areas of high pressure were sufficiently well marked to be charted, and of this number three moved into the continent from the United States North Pacific coast. In July, 1901, there were also six areas charted; then, however, nearly all the areas first appeared in the Canadian North-west Territories.

No. 1 covered the Ohio Valley on the 1st, when fine weather prevailed in Ontario and Quebec. On the 2nd it drew southward to the Carolinas; between the 4th and 6th it lay over Tennessee and its environments, and on the 7th it united off the New England coast with No. 2. After the 1st its influence on Canadian weather was not appreciably marked. No. 2 appeared in the Lake Superior district on the 3rd, and after arriving on the 6th in the Lower St. Lawrence Valley it passed southwards. It was a feeble area, but attended by several fine days in Eastern Canada. No. 3 was first shewn on the United States North Pacific coast on the 5th, its ultimate course being over the North-west States to Dakota, thence south of the Lakes to Virginia, where, on the 14th, it broke up. It was a well defined area of widespread proportion; and during its presence on the continent fine periods of weather were generally experienced in Canada. No. 4 also first appeared on the United States Pacific coast, its path between the 15th and 17th being at first northward into British Columbia, thence southward and eastward to the Middle Atlantic States, where, on the 23rd, it likewise dispersed. No. 5 was at first in evidence in much the same locality as its two predecessors, but after reaching the North-west States it dispersed. No. 6 was another feeble area which appeared in the North-west Territories on the 30th, and after reaching the Lake Region on the 1st of August, it also disappeared. Throughout its short-lived course, it was accompanied by very fine weather.

#### LOW AREAS.

Nine areas of low pressure were charted during the month, their general course being from British Columbia and the North-west Territories over Canada, their centres usually passing far to the northward. Ontario apparently received the bulk of the rainfall accompanying the depressions, and some of the thunderstorms which were experienced in the Province were exceptionally heavy, developing locally into a tornado on at least one occasion.

No. 1 was situated in the Middle Pacific States on the morning of the 1st, and travelling north-eastward it reached Northern Dakota on the 3rd, whence it backed into Alberta, where it hovered until the night of the 4th. It then moved slowly into Manitoba, and afterwards passed quickly eastward far north over Canada, arriving in the Gulf of St. Lawrence during the evening of the 8th. In the North-west Territories and Manitoba during the presence of this area, rain fell generally heavily attended by numerous thunderstorms, the rainfall being excessive in Southern Alberta where serious freshets were caused, doing much damage. In Ontario, Quebec and the Maritime Provinces it brought showers and thunderstorms, which were widely experienced, but as a rule the precipitation was not heavy. No. 2 was a shallow depression and seemingly an offshoot of No. 1. It passed over the Lake Region on the 3rd and the Maritime Provinces during the 4th, accompanied throughout its course by numerous showers and thunderstorms. No. 3 travelled over Canada between the 11th and 11th from Northern British Columbia to the Gulf of St. Lawrence. It was a shallow depression, and its accompanying showers and thunderstorms were only locally experienced. No. 4 was another shallow depression, which travelled between the 12th and 16th from Alberta to the Gulf of St. Lawrence, but, unlike its predecessor, it was attended by numerous showers and heavy thunderstorms, especially from Ontario to the Maritime Provinces. No. 4 traversed British Columbia on the 11th, and the Territories and Manitoba between the 15th and 16th. After reaching the Lake Superior district on the morning of the 17th it took a south-easterly course over the Ottawa and St. Lawrence Valleys, passing on the



18th off the Nova Scotia coast. It was an energetic area, its presence being marked in all directions by widespread showers and heavy thunderstorms. It was during the passage of this area that the destructive storm of the tornado type occurred at Chesterville in the Upper St. Lawrence Valley. No. 6 gave between the 19th and 21st general heavy rains in the Lake Region. In the Ottawa and St. Lawrence Valleys on the 21st it also caused a general and moderately heavy rainfall, whilst in the Maritime Provinces there were a few scattered showers only. It was a shallow depression which appeared in the vicinity of New Mexico, and after reaching the Lakes it passed to the New England coast and dispersed. No. 7—The course of this area from Vancouver Island to Manitoba was somewhat doubtful, but after reaching the Lake Superior district on the evening of the 26th it travelled quickly eastward, and on the 28th it passed into the Gulf of St. Lawrence. Very little rain attended it except in Ontario, where showers and thunderstorms were both widespread and heavy. In British Columbia and the North-west Territories its presence was marked by extremely warm weather, especially in the former Province. No. 8 was situated on the evening of the 26th in British Columbia, near the Rocky Mountains, and on the 30th it dispersed over the Lake Superior district. It was accompanied by fairly general showers and thunderstorms which extended as far east as the Georgian Bay Region and the Ottawa Valley. No. 9 moved into British Columbia during the night of the 30th, and reached Alberta by the night of the 31st. It was accompanied by local showers and thunderstorms.

### WINDS.

On Vancouver Island and in the Lower Mainland of British Columbia the direction was largely westerly; fresh to strong winds were of almost daily occurrence, and the force of a moderate gale was attained on one occasion.

In the North west Territories and Manitoba the direction was also mostly westerly. In the former districts fresh or strong breezes were experienced on twenty-three days and there was one gale, and in the latter Province there were twenty days with fresh or strong breezes and two gales.

In the Lake Region the direction was westerly on twenty days and variable on others. There were thirteen days with fresh breezes and three with strong winds. No gales were recorded irrespective of local thunder squalls.

In the Ottawa and St. Lawrence Valleys the direction was westerly on eighteen days and variable at other times. There were twelve days with fresh and five with strong breezes. No gales were recorded irrespective of local thunder squalls.

In the Gulf of St. Lawrence the direction was westerly on nineteen days and easterly on eight days. Fresh or strong breezes were recorded on twenty-three days, but no gales.

In the Maritime Provinces the direction was westerly on nineteen and easterly on five days. Only one strong wind was recorded, but there were thirteen days with fresh breezes. There were no gales.

No storm warnings were issued during the month.

### TEMPERATURE.

The temperature was about average in Manitoba and Ontario east as far as the Muskoka District, and south to Lake Ontario, including all the peninsula excepting the north shore of Lake Erie. The greatest positive departures, amounting to from three to four degrees, occurred over the Straits of Mackinaw and in the Georgian Bay Region. Elsewhere in Canada the temperature varied from average to four degrees below, the chief negative departures being reported in Northern British Columbia and in Assiniboia.

*The Highest and Lowest temperatures in each Province during July, 1902, were:*

British Columbia,	96°·0 on 20th at Kamloops,	30°·0 on 6th at Barkerville.
North-west Territories,	96°·0 on 31st at Medicine Hat.	33°·0 on 8th at Gatesgarth.
Manitoba,	90°·2 on 23rd at Winnipeg,	41°·0 on 18th at Bowman.
Ontario,	98°·0 on 24th at Point Clark,	32°·2 on 16th at White River.
Quebec,	87°·0 on 8th at Roberval,	39°·0 on 17th at St. Agathe.
New Brunswick,	88°·0 on 31st at Chatham,	39°·0 on 6th at Sussex.
Nova Scotia,	91°·0 on 16th at Wolfville,	35°·8 on 7th at Truro and Parrsboro.
Prince Edward Island,	83°·8 on 29th at Charlottetown,	42°·0 on 7th at Hamilton.

## BRIGHT {SUNSHINE.

Bright sunshine was below the average in Ontario and Quebec, but in the other portions of Canada it was above the average amount. The minus departures varied from 3 per cent at Montreal and Ottawa to 11 per cent at Lindsay. The plus departures were 2 per cent at Victoria, B.C., 5 per cent at Fredericton, and from 6 to 11 per cent in the Territories and Manitoba.

## PRECIPITATION.

In all parts of Ontario east of Lake Superior the rainfall was largely above the average amount, especially from the Georgian Bay south to Lake Erie, where in nearly all localities the average was exceeded by from 3 to 5 inches and over. East of Lake Ontario some excessive positive departures were also recorded, noticeably Peterboro', 5·9 inches and Port Hope 5·7 inches. Alberta rainfall was also generally above the average, ranging from two-tenths of an inch in the northern portion to over 2 inches in the southern portion. The rainfall at Calgary of 5 inches, making in all for the three months of May, June and July, no less than 23·7 inches, is a phenomenal amount when it is considered that the average mean annual precipitation for this station is only 15 inches. Elsewhere throughout Canada the rainfall was below the average, but in British Columbia, Quebec and in the greater part of Assiniboia and Saskatchewan to a small extent only. In Manitoba it was from 1 to nearly 2 inches below, and in the Maritime Provinces it was from 1½ to nearly 3 inches less than the average, several districts in the latter provinces complaining of damage owing to drouth.

# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JULY, 1902.

a. Barometer not reduced to Sea Level. • Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	PRESSURE.			TEMPERATURE.			DIRECTION OF WIND FROM						VELOCITY OF WIND			PRECIPITATION.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
			Elevation above sea level, in feet.	Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Highest.	Date.	Lowest.	Date.	Mean daily range.	Mean relative humidity.	Mean amount of cloud.	N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.	C.	Tenth number of hours.	Mean miles per hour.	Highest days velocity.	Date and direction from.	Amount.	Difference from average.	Heaviest fall in month.	Days with 1/10 or more.	No. of Anemoms.	No. of Fogs.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
BRITISH COLUMBIA:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JULY, 1902.

a. Barometer not reduced to Sea Level. \*Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above Sea Level in feet.	PRESSURE.		TEMPERATURE.			DIRECTION OF WIND FROM										VELOCITY OF WIND			PRECIPITATION.			No. of Thunderstorms.															
				Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Years observed.	Highest.	Date.	Lowest.	Date.	Mean daily.	Mean temperature of humidity.	Mean amount of cloud.	No. of days complete.	N.	N.E.	E.	S.E.	S.	S.W.		W.	N.W.	C.	Total number of hours.	Mean miles per hour.	Highest days.	Date and direction from.	Amount.	Difference from average.	Heaviest fall in month.	Days with 0.1 or more.	No. of fair days.	No. of Storms.		
N.W. TERRITORIES.—Cont.																																								
Indian Head	50 28 103 40	1024	1024	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	17	6	0	9	2	3	6	35	13	0	93	1.5	4.5	1.5	1.5	4.5	4.5	0	2	0	0	
Washington Manor	49 43 103 24	2664	2664	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macdonald	49 44 103 24	1879	1879	29.85	29.85	29.85	29.85	0	62.9	1.80	1880	40.0	29.85	40.0	29.85	29.85	29.85	29.85	0	0	0	0																		



PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JULY, 1962.

\*, Parameter not reduced to sea level. \* Stations not furnished with Registering Thermometers.

[illegible]

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
JULY, 1902.

STATIONS.	RAINFALL.				Date.	REMARKS.
	Amount in inches.	No. of Days or Over.	No. of Fair Days.	Heaviest Fall in Month.		
<b>BRITISH COLUMBIA—</b>	in.			in.		
Caulfields.....	3.36	8	17	1.98	31	
Goldstream Lake.....	1.62	6	24	0.58	15	
Kuper Island.....	0.84	10	21	0.36	31	Thunder 14th.
Nasas Harbour.....	2.66	17	14	0.52	22	
Port Essington.....	4.45	18	13	0.90	29	
Royal Oak.....	0.82	8	23	0.20	20	
Nanaimo.....	0.80	6	25	0.30	15	
Copitlam.....	2.28	10	21	0.72	31	
<b>N. W. TERRITORIES—</b>						
Salteoats.....	2.03	9	22	1.25	3	Thunder 15th, 19th and 31st.
Whitewood.....	1.41	4	27	1.03	3	Haying 1th; thunder 27th.
Weyburn.....	1.51	4	27	0.90	2	Thunder 2nd, 27th and 31st.
Cutts.....	5.49	4	4	2.20	2 3	
Dirt Hills.....	3.10	6	25	2.11	3	Thunder 2nd, 3rd, 18th, 22nd, 27th and 31st.
Stirling.....	4.95	7	24	3.58	1 4	
Buederhem.....	5.82	14	17	1.97	5 6	Thunder 15th.
Calgary.....	1.70	13	18	1.65	3	Thunder 11th, 21st, 25th and 26th.
Regina.....	1.42	8	21	0.63	3	Thunder 3rd, 15th, 27th and 30th.
Victoria.....	4.91	13	18	0.95	3	Thunder 5th and 26th.
Beaver Hills, E.....	1.17	11	20	1.33	6	Thunder 10th, 15th, 27th and 31st.
Beaver Hills, W.....	1.39	14	17	0.87	5	Thunder 5th, 9th, 11th, 12th, 15th, 16th, 31st.
Innisfail.....	4.89	11	20	2.20	4	Hail 11th.
<b>MANITOBA—</b>						
Norquay.....	1.36	9	20	0.52	4	Thunder 4th, 6th, 14th, 18th, 20th, 21st, 22nd, 24th and 28th.
<b>ONTARIO—</b>						
Montague.....	0.75	4	27	0.40	21	
Westminster.....	10.14	12	19	2.13	18 20	Thunder 14th and 27th.
Nottawasaga.....	5.30	11	20	0.80	2	Thunder 3rd, 4th, 14th, 16th, 23rd, 26th and 31st.
Sunshine.....	4.36	13	18	1.03	20	Thunder 7th, violent, 9th, 15th, 24th and 27th.
Dutton.....	7.51	10	21	2.75	20	Thunder 1st.
Emisdale.....	6.70	17	14	1.32	14	Thunder 4th, 5th, 6th, 7th, 14th, 15th, 22nd, 23rd, 26th, 27th and 31st.
Georgetown.....	5.90	19	11	1.19	7	Thunder 3rd, 7th, 14th, 17th, 22nd, 23rd, 24th, 26th, 27th and 31st; fog 21st, 25th and 26th.
Scarboro'.....	5.27	14	13	1.03	26	Thunder 4th, 5th, 7th, 9th, 14th, 17th, 23rd, 25th, 26th, 27th and 31st; hail 14th.
Lansdowne.....	3.24	6	25	0.72	7	
Westport.....	2.59	13	18	0.46	14	Thunder 7th, 14th, 23rd and 24th; hail 14th.
Dealtown.....	5.72	11	19	1.91	20	Thunder 3rd, 14th, 19th and 28th.
Oliver's Ferry.....	1.38	7	24	0.50	21	
Arden.....	3.66	14	17	1.07	15	Thunder 5th, 8th, 15th, 16th, 24th, 25th and 27th.
Wooler.....	8.18	14	17	1.50	5	Thunder 4th, 5th, 14th, (terrible) 23rd, 26th and 27th.
Jermyn.....	5.13	10	21	1.30	3	Thunder 5th, 7th, 16th, 22nd and 23rd.
Watford.....	6.11	13	18	1.00	3	
Croydon.....	3.94	9	22	0.75	14	
Parma.....	3.78	9	22	0.75	5	
Uxbridge.....	6.47	14	17	1.17	27	Thunder 4th, 27th and 31st; hail 27th.
Goderich.....	2.60	8	23	1.00	19	
Port Burwell.....	6.71	13	18	2.07	3	3rd, very heavy storm.
Warton.....	5.52	12	19	1.20	2	Thunder 4th, 5th, 7th, 14th, 16th, 26th and 31st.
Wyoming.....	8.20	13	18	1.45	27	Thunder 3rd, 7th, 9th, 14th, 17th, 20th, 23rd, 25th and 27th.
Chynua.....	5.49	13	15	1.26	19	
Midland.....	5.12	13	18	1.27	4	Thunder 2nd, 4th, 5th, 6th, 7th, 14th, 23rd, 26th and 31st.
Prince-ton.....	6.56	11	20	2.95	20 21	Thunder 7th, 9th, 16th, 23rd, 24th and 27th.
Emm-stone.....	10.37	10	21	3.10	6	
Aurora.....	5.86	10	21	1.90	31	Thunder 4th, 7th, 14th, 23rd, 26th, 27th and 31st.
Orangeville.....	7.41	16	15	1.75	20 21	7th, very heavy thunder.
Smith Falls.....	1.99	7	24	0.48	27	13th, terrible wind and rain storm.
Ursa.....	5.88	15	16	1.47	3	Thunder 5th, 6th, 7th, 8th, 11th, 14th, 15th, 22nd, 23rd, 24th, 26th and 31st.
Lynedoch.....	7.28	10	21	1.77	3	9th, heavy rain, much damage to crops.
Lion's Head.....	3.30	11	20	0.78	2	Thunder 4th, 7th, 14th and 26th.
Deer Park.....	6.24	15	16	1.53	27	Thunder 15th, heavy.
Providence Bay.....	2.34	15	6	0.65	2	Thunder 5th, 13th, 14th and 23rd.
<b>NEW BRUNSWICK—</b>						
Poin-t-Escummac.....	2.62	5	26	1.41	3	
<b>NOVA SCOTIA—</b>						
Port Morien.....	2.58	7	24	1.39	16-17	17th, heavy thunder storm.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF JULY, 1902.

	Hours Ending															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria	0 00	0 26	0 50	0 56	0 64	0 68	0 72	0 79	0 80	0 82	0 77	0 72	0 73	0 70	0 34	0 00
Nanaimo	0 15	0 51	0 52	0 60	0 64	0 67	0 67	0 60	0 61	0 59	0 58	0 57	0 62	0 55	0 55	0 10
Agassiz	0 00	0 00	0 14	0 30	0 49	0 50	0 55	0 47	0 55	0 56	0 55	0 47	0 45	0 34	0 11	0 01
Battleford	0 46	0 60	0 63	0 65	0 70	0 70	0 63	0 64	0 73	0 71	0 66	0 64	0 58	0 63	0 53	0 11
Indian Head																
Brandon	0 11	0 71	0 85	0 89	0 83	0 82	0 84	0 79	0 76	0 77	0 74	0 69	0 78	0 51	0 01	0 00
Winnipeg	0 08	0 44	0 65	0 71	0 82	0 86	0 86	0 83	0 85	0 90	0 85	0 85	0 68	0 67	0 49	0 07
Woodstock	0 00	0 19	0 48	0 59	0 63	0 76	0 77	0 78	0 63	0 64	0 60	0 63	0 56	0 58	0 37	0 05
Toronto	0 00	0 16	0 52	0 60	0 61	0 63	0 67	0 74	0 73	0 68	0 69	0 64	0 55	0 52	0 44	0 05
Lindsay	0 00	0 11	0 24	0 46	0 57	0 61	0 64	0 59	0 59	0 49	0 52	0 52	0 38	0 36	0 31	0 03
Barrie																
Gravenhurst	0 00	0 24	0 52	0 50	0 54	0 65	0 64	0 66	0 66	0 70	0 69	0 58	0 54	0 57	0 48	0 26
Kingston	0 00	0 07	0 41	0 58	0 63	0 68	0 72	0 70	0 72	0 70	0 65	0 60	0 53	0 48	0 25	0 00
Ottawa	0 00	0 17	0 57	0 62	0 62	0 66	0 71	0 67	0 63	0 66	0 65	0 56	0 54	0 47	0 24	0 00
Montreal	0 01	0 24	0 44	0 47	0 56	0 63	0 63	0 60	0 63	0 63	0 61	0 58	0 62	0 53	0 11	0 00
Fredericton	0 36	0 52	0 59	0 65	0 67	0 65	0 63	0 67	0 60	0 62	0 64	0 58	0 54	0 53	0 10	0 00
	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Barrie.	Gravenhurst.	Kingston.	Ottawa.	Montreal.	Fredericton.
Mean proportion for month (Constant sunshine being 1.)	0 58	0 54	0 35	0 64	...	0 64	0 67	0 54	0 54	0 46		0 54	0 51	0 51	0 56	0 55
Difference from average.	0 02		0 11	0 06		0 00	0 09	0 04	0 06	0 11			0 06	0 03	0 03	0 05
Maximum daily amount	0 86	0 94	0 77	1 00		0 84	0 88	0 89	0 90	0 92		0 93	0 84	0 85	0 97	0 92
Date.	92425	24	9	21		10	11	13	25	11		9	12	8	11	2
No. of days completely clouded	0	2	8	2		0	0	3	2	6		1	3	0	2	4



*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

3. Haileybury, IV ; Cape Chatte, III.
5. Pictou, IV.
6. Pembina Crossing, IV.
7. Haileybury, IV.
9. Haileybury, II.
24. Haileybury, III ; Chicoutimi.
25. Pembina Crossing, IV ; Savanne, Emsdale, IV.
26. Pembina Crossing, IV.

*Thunder recorded on :—*

1. Pembina Crossing, Quebec, Brome, Channel Island, Tobacco Plains, Threehills Creek, Moosomin, Oonikup.
2. Port Dover, Brantford, Lakefield, North Bruce, Summerside, Weyburn, Dirt Hills, Minnedosa, Ridgetown, Grenfell.
3. Port Stanley, Barnardo, Pembina Crossing, Quebec, Peterboro', Port Dover, Point Clark, Almasippi, Manor, Gatesgarth, Moose Jaw, Hillview, Dealtown, Dirt Hills, Regina, Georgetown, Wyoming, Jermyn, Emsdale, Qu'Appelle, Swift Current.
4. Port Stanley, Toronto, Lindsay, Stony Mountain, Pembina Crossing, Beatrice, Welland, Collingwood, Orillia, Port Dover, Kinnmount, Port Hope, Dunnville, Agincourt, Haliburton, Point Clark, North Bruce, Owen Sound, Meaford, Oakbank, Uplands, Bullion, Hillview, Aurora, Lion's Head, Norway, Scarboro' Georgetown, Midland, Wiarton, Uxbridge, Emsdale, Winnipeg, Minnedosa, Bowsman, Threehills Creek, Oonikup.
5. Port Stanley, Toronto, Guelph, Deseronto, Lindsay, Gravenhurst, Stony Mountain, Pembina Crossing, Beatrice, White River, Welland, Peterboro', Bala, Port Dover, Kinnmount, Port Hope, Dunnville, Agincourt, Haliburton, Point Clark, Erasmus, Lakefield, *severe* ; North Bruce, Otonabee, Meaford, Rat Portage, Almasippi, Hillview, Ursa, Providence Bay, Victoria Alt., Scarboro', Jermyn, Wooler, Arden, Emsdale, Winnipeg, Minnedosa, Massett, Bon Accord, Oonikup, W. Beaver Hills.
6. Deseronto, Lindsay, Welland, Peterboro', Orillia, Agincourt, Haliburton, Rat Portage, Uplands, Ursa, Norquay, Emsdale, Abitibi, Minnedosa.
7. Port Stanley, Parry Sound, Toronto, London, Lindsay, Gravenhurst, Haileybury, Stratford, Stony Mountain, Montreal, Beatrice, Welland, Lucknow, Peterboro', Bala, Cockburn Island, Hamilton, Kinnmount, Port Hope, Paris, Dunnville, Agincourt, Haliburton, Point Clark, Brantford, Erasmus, Lakefield, Bruce Mines, North Bruce, Owen Sound, Meaford, Otonabee, Oakbank, Clontarf, Stony Creek, Uplands, Brome, Cape Chatte, Westport, Sunshine, *very heavy* ; Orangeville, *very heavy* ; Aurora, Princeton, Lion's Head, Scarboro', Georgetown, Midland, Wyoming, Wiarton, Jermyn, Wooler, Port Arthur, Winnipeg, Ridgetown, Kingston.
8. Port Stanley, Guelph, Montreal, Quebec, White River, Welland, Lucknow, Otonabee, Summerside, Sussex, Bathurst, Moncton, Chicoutimi, Perce, Arden, Father Point, Chatham, St. John, Pictou.
9. Port Stanley, Toronto, London, Truro, Halifax, Brantford, Erasmus, North Bruce, Stony Creek, Sunshine, Princeton, Lynedoch, Westminster, Scarboro, Wyoming, Stuart Lake, W. Beaver Hills.
10. Rat Portage, Okanagan, Mission, Athabasca Landing, Bowsman.
11. Rat Portage, Manor, Duck Lake, Ursa, Broomhill, Banff, Edmonton, Athabasca Landing, Swift Current, Prince Albert, Calgary, Pictou, Threehills Creek, Bon Accord, Oonikup.
12. Pembina Crossing, Perce, Melfort, Edmonton, Bowsman, Battleford, Threehills Creek.
13. Haileybury, Barnardo, Quebec, St. Agathe, Brome, Chicoutimi, Shawinigan Falls, Alameda, Duck Lake, Melfort, Hillview, Qu'Appelle, Minnedosa, Father Point, Bissett, Bowsman, Prince Albert, Oonikup.
14. Port Stanley, Toronto, London, Guelph, Deseronto, Lindsay, Gravenhurst, Renfrew, Stratford, Chilliwack, Nanaimo, Quebec, Beatrice, St. Agathe, White River, Lucknow, Peterboro', Bala, Kingston, Orillia, Port Dover, Kinnmount, Port Hope, Paris, Dunnville, Agincourt, Dalhousie Mills, Haliburton,

Brantford, Erasmus, Otonabee, N. Nicomen, Clontarf, Stony Creek, Uplands, Princeton, Bullion, Brome, Shawinigan Falls, Hillview, Pilot Bay, Dealtown, Aurora, Lion's Head, Providence Bay, Westminster, Norquay, Westport, Scarboro', *hail* : Georgetown, Midland, Wyoming, Wiarton, Wooler, *terrible* : Emsdale, *severe* : Kuper Island, Minnedosa, Bermuda, Bissett, Okanagan Mission, Ridgetown, W. Kootenay, Nicola Lake, Port Bobs, Threehills Creek.

15. Fredericton, Port Stanley, Parry Sound, Ottawa, London, Deseronto, Lindsay, Gravenhurst, Peregé, Barnardo, Pembina Crossing, Montreal, Quebec, Beatrice, Welland, Peterboro', Bala, Agincourt, Port Hope, Haliburton, Otonabee, Clontarf, Uplands, Brome, Channel, Gatesgarth, Moose Jaw, Hillview, Pilot Bay, Sunshine, Ursa, *hail* : Deer Park, Saltecoats, Bruederheim, Regina, Arden, Qu'Appelle, Banff, Kamloops, Edmonton, Medicine Hat, Bissett, Okanagan Mission, Ridgetown, Cranbrook, Tobacco Plains, Kingston, Grenfell, Bon Accord, W. Beaver Hills.

16. White River, Peterboro', Cockburn Island, Agincourt, Brantford, North Bruce, Summerside, Meaford, Oakbank, Channel, Princeton, Jernyn, Arden, Port Arthur, Yarmouth, Bermuda, Oonikup, W. Beaver Hills.

17. Port Stanley, Ottawa, Toronto, Guelph, Haileybury, Montreal, Quebec, Agincourt, N. Bruce, Owen Sound, Scarboro', Georgetown, Wyoming, Yarmouth, Ridgetown, Battleford, Threehills Creek.

18. White River, Lakefield, Rat Portage, Dirt Hills, Banff, Yarmouth, St. John, Bowsman, Swift Current.

19. Point Clark, Almasippi, Hillview, Dealtown, Saltecoats, Minnedosa

20. Port Stanley, Stony Mountain, Dunnville, Point Clark, Hillview, Wyoming, Bowsman.

21. Port Stanley, Toronto, White River, Haliburton, Point Clark, Rat Portage, Oakbank, Broomhill, Norquay, Abitibi, Banff, Bowsman, Ridgetown, Golden.

22. London, Lakefield, North Bruce, Otonabee, Glacier, Stony Creek, Gatesgarth, Georgetown, Yarmouth, Prince Albert, Stuart Lake, Bon Accord.

23. Toronto, Lindsay, Gravenhurst, Haileybury, Stratford, Pembina Crossing, Grand Manan, St. Agathe, Sarnia, Collingwood, Lucknow, Peterboro, Orillia, Port Dover, Hamilton, Kimmount, Paris, Agincourt, Haliburton, Point Clark, Brantford, Erasmus, Lakefield, N. Bruce, Owen Sound, Otonabee, Meaford, Clontarf, Stony Creek, Princeton, Ursa, Providence Bay, Westminster, Scarboro', Georgetown, Midland, Wyoming, Jernyn, Craileith, *hail* : Emsdale, Qu'Appelle, Yarmouth, Bowsman, Battleford, Threehills Creek.

24. Port Stanley, London, Guelph, Lindsay, Gravenhurst, Stratford, Barnardo, Quebec, Beatrice, Welland, *destructive hail storm* : Peterboro, Port Dover, Hamilton, Paris, Dunnville, Erasmus, Point Clark, Lakefield, N. Bruce, Otonabee, Clontarf, Stony Creek, Brome, Shawinigan Falls, Sunshine, Princeton, Ursa, Westminster, Norquay, Westport, Scarboro', Georgetown, Swift Current.

25. Port Dover, Point Clark, Lakefield, Scarboro', Georgetown, Wyoming, Arden.

26. Port Stanley, Parry Sound, Toronto, London, Gravenhurst, Haileybury, Stratford, Beatrice, White River, Lucknow, Bala, Cockburn Island, Port Dover, Port Hope, Agincourt, Point Clark, Erasmus, Lakefield, N. Bruce, Owen Sound, Otonabee, Meaford, Uplands, Princeton, Bullion, Gray Hills, Alberni, Aurora, Ursa, Lion's Head, Broomhill, Victoria Alt., Georgetown, Midland, Wooler, Emsdale, Abitibi, Banff, Bermuda, Golden, Stuart Lake.

27. Toronto, Deseronto, Lindsay, Stratford, Peterboro, Bala, Port Dover, Hamilton, Port Hope, Paris, Agincourt, Lakefield, N. Bruce, Otonabee, Clontarf, Uplands, Didsbury, Alameda, Duck Lake, Melfort, Gatesgarth, Moose Jaw, Hillview, Sunshine, Aurora, Princeton, Westminster, Weyburn, Whitewood, Dirt Hills, Regina, Georgetown, Midland, Wyoming, Uxbridge, *hail* : Emsdale, Abitibi, Bermuda, Ridgetown, Battleford, Calgary, Picton, Grenfell, Threehills Creek.

28. Fredericton, London, Pembina Crossing, Quebec, Grand Manan, N. Nicomen, Didsbury, Dealtown, Norquay, Banff, Bermuda, Grenfell, Threehills Creek.

29. Savanne, Crescent Lake, Hillview, Port Arthur, Minnedosa, Victoria, Threehills Creek.

30. Regina, Calgary.

31. Parry Sound, Gravenhurst, Barnardo, Montreal, Quebec, Beatrice, White River, Peterboro, Bala, Orillia, Agincourt, Haliburton, Erasmus, Bruce Mines, N. Bruce, Owen Sound, Otonabee, Crescent Lake, Glacier, N. Nicomen, Clontarf, Uplands, Melfort, Gray Hill, Uxbridge, Emsdale, Banff, Okanagan Mission, Nicola Lake, Battleford, Swift Current, Crane Lake, Moose Jaw, Vancouver, Aurora, Ursa, Saltecoats, Midland, Wiarton, Stuart Lake, Threehills, Bon Accord, W. Beaver Hills.

## FORECASTS FOR JULY, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1,061. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	89	68	18	3	86.5
Lake Superior.....	105	80	19	6	85.2
Lower Lake Region.....	120	104	10	6	90.8
Georgian Bay.....	118	97	16	5	89.0
Ottawa Valley.....	97	81	11	5	89.2
Upper St. Lawrence.....	97	82	12	3	90.7
Lower St. Lawrence.....	105	81	21	3	87.1
Gulf.....	109	96	8	5	91.7
Maritime Provinces, West.....	112	94	13	5	89.7
Maritime Provinces, East.....	109	90	13	6	88.5
Total.....	1,061	873	141	47	88.9

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,

*Director.*

Meteorological Office, Toronto,

26th August, 1902.



# METEOROLOGICAL SERVICE, DOMINION OF CANADA.

## Monthly Weather Review.

VOL. XXVI

AUGUST, 1902.

No. 8

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### REMARKS UPON THE WEATHER.

British Columbia—On Vancouver Island and the Gulf Islands the month was generally fair, and with the exception of a hot week from the 5th it was comparatively cool with sunshine below the average. At Victoria showers occurred on four days; the winds were mostly south and west, and there was a moderate gale on the 27th. In the neighbourhood of Nanaimo there were numerous bush fires during the early part of the month and considerable rain during the last part; a northerly gale blew during the 5th, 6th and 7th. On the mainland the month was fair with occasional showers, and was reported favourable for crops and fruit in all districts.

North-west Territories and Manitoba—Heavy rains continued over the southern portion of Alberta, but in all other parts of the Territories and Manitoba the rainfall was less than average, and the weather generally was fine with a mean temperature differing very little from normal. These conditions, following the heavy rains of the previous month, were favourable for ripening crops, except in Alberta, where far more than the average warmth was hoped for, to compensate for the cool, wet weather, which had retarded growth in early summer. No frost of any importance occurred, and by the end of the month the harvesting of enormous crops was well advanced in Manitoba and the eastern portions of Saskatchewan and Assiniboia.

Ontario—The weather of August in this province was mostly fine, cool and dry, much bright sunshine occurring during the first four days; also from the 11th to 17th and 20th to 30th. Exceptions to these conditions, however, occurred in districts contiguous to Muskoka, the Georgian Bay, and in the County of Lambton, where it was somewhat wetter than usual. A severe storm, which was described as a cyclone, passed over St. Catharines on the 2nd, doing much damage to house and farm property. Grass lands and vegetation generally were green and luxuriant throughout the month, and farm crops, which were backward on the 1st, made excellent progress. The fine, warm weather prevailing during the latter portion of the month was exceedingly favourable to agriculture, most grain crops being cut and quickly housed.

Quebec—The weather was mostly fair and moderately warm, with occasional showers, especially during the night. The first few days and the last of the month were quite warm, but the nights rather cool. The mean temperature was 3° lower than in the same month the previous year, and the rainfall was two inches less. Crops were reported good in nearly all the districts.

New Brunswick—The weather during August, while unusually dull, unsettled and showery, was the finest of the summer, and was exceptionally free from fogs. Reports from all sections of the Province indicated good crops, both of grain and roots.

Nova Scotia—Halifax—Up to the 17th winds were south and south-west, with rain nearly every day; the latter part of the month was exceptionally fine with high temperatures. A south-west veering to westerly gale occurred in Cape Breton on the 17th.

Prince Edward Island—Weather during the greater part of August was cool and wet, but the latter part of the month was fine and warm and favourable for ripening. Crops of all kinds, although somewhat late, were reported in fine condition.

## ATMOSPHERIC PRESSURE.

The mean pressure for August was above the normal over Northern Ontario, and below in other parts of the Dominion. The highest positive excesses reported were 0.03 inch at White River and 0.02 at Port Arthur, and the largest negative was 0.06 at Victoria, B.C., and 0.08 at Grand Manan, N.B. All stations in the St. Lawrence Valley and Maritime Provinces, and also in the North-west Territories, showed negative departures of 0.03 or over. The absolutely highest mean reported was 30.05 (sea level) at Victoria, and the lowest, 29.82, at Prince Albert.

## HIGH AREAS.

Seven areas of high pressure were sufficiently defined to be charted as follows:—

No. 1 was situated in British Columbia on the 1st. It passed over the Territories and Manitoba between the 2nd and 3rd, and on the 4th dispersed over Lake Superior. It was accompanied by fine warm weather. No. 2 appeared on the North Pacific coast on the 3rd, and after skirting the boundary to Dakota it drew southward, and on the 7th dispersed over Tennessee. No. 3 travelled nearly eastward across the continent between the 7th and 10th from Montana to the Nova Scotian coast. It was a very feeble area, but generally attended by fine, pleasant weather. No. 4 moved on the 9th from Central British Columbia into Alberta, and then south-eastward, reaching Kansas on the 11th. Its course was afterwards over the southern portion of the Lower Lake Region to the United States Atlantic seaboard. It was also attended by fine, pleasant weather. No. 5 was seemingly subsidiary to No. 4. On the evening of the 13th it was situated over Lake Winnipeg, and passing slowly south-eastward over the Lake Region it arrived on the 18th on the United States Middle Atlantic coast, being likewise accompanied over its course by fine weather. No. 6 was first in evidence in very much the same locality as its predecessor, and took much the same course. On the 20th it was situated near Lake Winnipeg, and on the 26th it broke up to the southward of Lake Ontario. No. 7 travelled from Northern British Columbia to Manitoba between the 24th and 25th, thence over the Lake Superior district to the Ottawa Valley, and after leaving the Ottawa Valley on the 29th it drew southward and dispersed. It was about the most pronounced anti-cyclone of the month, and during its presence fine, cool weather prevailed in Canada, the night temperatures in northern localities falling nearly to the freezing point.

## LOW AREAS.

Thirteen areas of low pressure were charted during the month, being a large number for August.

No. 1 was a continuation of No. 9 on the July chart. It was centred in the Qu'Appelle Valley on the morning of the 1st, and passing north of the Lake Region it reached the Lower St. Lawrence Valley on the evening of the 3rd and the Gulf of St. Lawrence on the 4th. It was attended throughout its course by local showers and thunderstorms. No. 2 appeared in British Columbia on the 2nd, traversed the Territories and Manitoba on the 3rd and 4th, passed over the Lake Region on the 5th, the Ottawa and St. Lawrence Valleys on the 6th, and reached the Gulf of St. Lawrence on the 7th. During its passage over the western portion of the continent it was accompanied by very few showers, but from the Lakes eastward showers and thunderstorms were numerous, some decidedly heavy rainfalls occurring in the Maritime Provinces, especially in the eastern portion. No. 3 travelled between the 5th and 8th from Northern Alberta to the Lower Lake Region, and dispersed in the vicinity of Lake Ontario. It was a feeble area, and its accompanying showers were not widely experienced. No. 4 appeared in Alberta on the 7th, reached Manitoba on the 9th, the Lake Region on 10th, the Ottawa and St. Lawrence Valleys on the 11th, and the Gulf of St. Lawrence on the 12th. It was an area of considerable energy, and attended by widespread showers and thunderstorms, together with strong winds, which, in a few instances, reached the force of a moderate gale. No. 5 travelled between the 11th and 13th from the North-west Territories to the Lake Superior District and then dispersed. There were only a few light scattered showers over its course. No. 6 was another shallow depression which was situated in the North Pacific States on the 12th, and passed to the northward of Saskatchewan on the 16th. Warm weather generally prevailed in the North-west Territories during the presence of this area, together with some local thunderstorms. No. 7 travelled between the 16th and 19th from the Middle Pacific States over the Lower Lake Region to the Middle Atlantic Coast, where it dispersed. During its presence on the Continent, showers and thunderstorms were generally experienced from British Columbia to the Lower Lake Region, an unusually heavy rainfall of over five inches occurring in Southern Alberta. No. 8 was a remarkable area. It developed over the eastern portion of the Maritime Provinces during the 16th, and on the morning of the 17th it was situated off the Cape Breton coast. During the day, however, it backed north-westward over the Gulf of St. Lawrence, and at night was centred somewhere near the coast of Gaspé. On the 18th it passed slowly eastward across Anticosti. It was attended over its course by exceedingly heavy rainfalls together with a gale of wind which in many localities is reported to have been severe. No. 9 was situated over Michigan on the 20th as a feeble area. Its course was over the Lower Lakes and the Upper St. Lawrence Valley, thence south-

ward, skirting the Nova Scotian coast. It brought general showers from Ontario to the Maritime Provinces, some heavy local rainfalls being experienced, chiefly in the St. Lawrence Valley. No. 10 was situated in British Columbia on the 20th, and after travelling slowly over the North-west Territories, it passed on the 24th to Lake Winnipeg, and out of the range of observation. It was a very feeble area, but during its presence fine warm weather prevailed generally in the North-west. No. 11 appears to have developed on the 25th near the Nova Scotian coast. It then moved northward on the 26th to the Gaspé coast, and on the 27th passed into the Straits of Belle Isle. It gave a few local showers over its course, together with strong winds in the Gulf of St. Lawrence. No. 12 was situated in the interior of British Columbia on the 25th, and passed out of the range of observation on the 29th to the northward of Saskatchewan. It drew very strong winds over the Territories and Manitoba, attended by warm weather and local thunderstorms. No. 13 travelled very quickly between the 30th and 31st from the Western States north-eastward across Lake Superior. It was an energetic area, bringing to the Lake Superior District heavy rains attended by strong breezes and moderate gales.

#### WINDS.

In British Columbia—On Vancouver Island and the Lower Mainland the direction was largely south and west, and the mileage was considerable, there being eighteen days in which a fresh breeze was recorded, and three days with strong winds.

In the North-west Territories the direction was also chiefly westerly with sixteen days of fresh breezes, nine of strong winds and one general gale.

In Manitoba the direction was mostly westerly and easterly. Three gales were experienced, and there were besides eight days of strong winds and thirteen of fresh breezes.

In the Lake Region no one direction was particularly prevalent, the north and west being perhaps the most in evidence. The force was not excessive, there being nine days on which a fresh breeze was experienced, and three days with a strong wind.

In the Ottawa and St. Lawrence Valleys the direction was much the same as it was on the Lakes with fourteen days of fresh breezes and only one day with widespread strong winds.

In the Gulf of St. Lawrence the direction was westerly on twenty days and easterly on seven. Fresh breezes were recorded on seventeen days, strong winds on six, and on the 17th there was a moderate to fresh gale.

In the Maritime Provinces the direction was mainly between the south and west. Fresh breezes were recorded on thirteen days and strong winds on two occasions, increasing locally on the 17th in the eastern portion to a gale.

No warnings were issued during the month.

#### BRIGHT SUNSHINE.

Bright sunshine ranged from 10 per cent above the average amount at Victoria, B.C., to just above the average at Winnipeg, Man. In Ontario the average was generally exceeded to a small extent except at Lindsay and Kingston where there was a slight deficiency. In Quebec, Montreal was 4 per cent above the average, and in the Maritime Provinces, Fredericton was 6 per cent below the average.

#### TEMPERATURE.

The mean temperature of August was slightly above average in portions of Saskatchewan and Manitoba, and also in New Brunswick and Quebec bordering on the Gulf of St. Lawrence, but over all other portions of the Dominion departures from average were negative. In Northern British Columbia the departure was between 3 and 6 degrees below, and in Ontario from 1 to 3 below.

*The Highest and Lowest temperatures in each Province during August, 1902, were :*

British Columbia,	94°·2 on 7th at Alberni,	29°·0 on 29th at Revelstoke.
North-west Territories,	93°·9 on 6th at Calgary,	25°·4 on 29th at Kneehill.
Manitoba,	94°·0 on 15th at St. Albans,	30°·0 on 31st at Bowman.
Ontario,	93°·0 on 31st at Stony Creek,	30°·0 on 22nd at White River.
Quebec,	83°·5 on 4th at Chicoutimi,	35°·0 on 16th at St. Agathe.
New Brunswick,	87°·0 on 30th at Chatham,	38°·0 on 29th at Sussex.
Nova Scotia,	86°·8 on 1st at Truro,	41°·3 on 29th at Truro.
Prince Edward Island,	83°·6 on 31st at Charlottetown,	47°·5 on 28th at Charlottetown,

#### PRECIPITATION.

In Southern Alberta, as for several months past, the rainfall was excessive, but over the North-west Territories generally it was less than average, as it also was in British Columbia. In Ontario it was for the most part below average, but from Montreal eastward it was well up to, or in excess of average, especially in Eastern Nova Scotia, where there were some excessive rainfalls during the first half of the month.

# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, AUGUST, 1902. a. Barometer not reduced to Sea Level. • Stations not furnished with Registering Thermometers.

STATION.	Latitude N.		Longitude W.	Elevation above Sea Level, in feet.		PRESSURE.		TEMPERATURE.				DIRECTION OF WIND FROM							VELOCITY OF WIND			PRECIPITATION.			No. of Foggy.	No. of Thunder storms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	°	'		Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Years observed.	Highest.	Date.	Lowest.	Date.	Mean daily range.	Mean temperature of day.	Mean amount of cloud.	No. of days completely clouded.	N.	N. E.	E.	S. E.	S.	S. W.			W.	N. W.	C.	Total number of hours.	Mean miles per hour.	Highest day's velocity.	Date and direction from.	Amount.	Difference from Average.	Heaviest fall in month.	Days with 0.1 or more.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, AUGUST, 1902.

u. Barometer not reduced to Sea Level. • Stations not furnished with Registering Thermometers.

[illegible]



PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
AUGUST, 1902.

STATIONS.	RAINFALL.					REMARKS.
	Amount in inches.	No. of Days of or Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.	
<b>BRITISH COLUMBIA—</b>	in.			in.		
Nanaimo .....	0.75	4	27	0.60	15	
Nas Harbour .....	11.58	19	12	3.33	4	
Port Essington .....	13.06	23	8	3.43	5	
Coquitlam .....	1.74	7	24	0.66	15	Thunder 27th.
Goldstream Lake .....	1.03	4	27	0.63	16	
Gaulfields .....	0.99	6	24	0.44	27	Thunder 27th.
Royal Oak .....	0.68	5	26	0.40	14	
Kuper Island .....	0.46	4	27	0.22	15	
<b>N. W. TERRITORIES—</b>						
Victoria .....	3.03	12	19	1.76	27	Thunder 1st, 7th and 16th.
Beaver Hills, W. ....	1.92	7	23	0.76	1	Thunder 7th, 11th, 15th, 23rd, 26th and 31st.
Broomhill .....	5.45	7	24	2.14	16	Thunder 8th and 15th.
Dirt Hills .....	0.90	6	25	0.39	18	Thunder 3rd, 17th, 18th, 19th, 23th and 27th.
Stirling .....	1.28	4	27	0.52	18	Frost on 28th.
Jinnisford .....	3.94	8	23	2.00	17, 18	
Weyburn .....	3.86	9	22	1.25	27	Thunder 3rd, 15th, 17th, 18th, 25th, 26th and 27th.
Whitewood .....	0.88	4	27	0.39	17	Thunder 17th, 18th, 26th and 27th.
Conits .....	1.15	2	29	0.65	18	
Bruderheim .....	3.49	10	21	1.53	15	Thunder 8th, 15th and 23rd.
Beaver Hills, E. ....	2.79	8	23	1.88	18	Thunder 8th, 11th and 23rd; frost 30th.
<b>MANTOBA—</b>						
Norquay .....	0.71	5	25	0.32	17	Thunder 31st; frost 11th and 21st.
Belmont .....	0.80	7	24	0.26	17	Thunder 1st, 14th, 17th, 28th, 31st.
Oak Lake .....	0.66	2	29	0.19	19	Frost on 29th.
Beaver .....	1.28	7	24	0.48	18	
Cartwright .....	1.32	7	24	0.51	17	
<b>ONTARIO—</b>						
Oliver's Ferry .....	1.15	7	24	0.25	3	
Port Barwell .....	1.25	4	27	1.13	7	
Lynedoch .....	1.42	3	28	0.34	4	1st, 93 in shade.
Uxbridge .....	0.84	8	23	0.31	18	
Goderich .....	1.03	5	26	0.50	5	
Emsdale .....	3.48	13	18	1.06	10	Thunder 4th, 8th, 11th and 31st.
Georgetown .....	1.97	9	20	0.40	7	Thunder 1st, 3rd, 5th, 6th, 20th, 27th and 31st.
Arden .....	1.79	15	16	0.44	21	Thunder 4th, 21st and 27th.
Lansdowne .....	2.66	6	25	1.22	1	Thunder 1st, 3rd, 21st and 26th.
Midland .....	3.03	9	22	0.79	20	Thunder 2nd and 5th.
Ursa .....	3.12	16	15	1.60	20	Thunder 2nd, 3rd, 4th, 5th, 7th, 20th, 26th and 31st.
Jermyn .....	1.07	3	28	0.62	21	
Panama .....	1.80	5	26	0.66	8	
Craigleith .....	3.82	11	20	1.54	20	
Wyoming .....	2.50	5	26	1.17	5	Thunder 1st, 3rd, 5th, 7th and 20th.
Westminster .....	1.99	5	26	0.81	7	Thunder 7th.
Nottawasaga .....	2.10	6	25	0.61	18	
Dutton .....	1.99	4	27	1.10	7	
Scarboro' .....	3.10	12	19	1.28	2	Thunder 1st and 2nd; hail 19th and 31st.
Aurora .....	0.80	8	23	0.39	17	
Orangeville .....	2.62	13	18	1.19	1	
Watford .....	1.55	5	26	0.60	7	
Croydon .....	2.32	5	26	0.90	21	Thunder 1st, 15th and 21st.
Lion's Head .....	3.14	7	24	1.20	20	Thunder 3rd, 10th and 20th.
Providence Bay .....	2.48	8	23	0.95	10	Thunder 3rd, 5th and 10th.
Dealtown .....	1.96	5	26	1.45	5	Thunder 5th; hail on 6th.
Huntsville .....	3.24	9	22	1.49	21	Thunder 3rd.
Westport .....	1.97	11	20	0.54	21	Thunder 3rd, 16th, 21st and 26th.
Montague .....	1.71	7	24	0.48	21	Frost 17th and 18th.
Wooler .....	1.59	9	22	0.52	21	
Cayuga .....	0.12	2	23	0.10	5	Frost 19th and 20th.
Warton .....	2.70	7	24	1.04	18	Thunder 1st, 5th, 9th, 20th and 31st.
Emmismore .....	1.66	4	27	1.00	20	
Glen Elba .....	1.90	8	23	0.41	11	
Princeton .....	1.64	5	26	0.90	6	
Deer Park .....	1.15	4	27	0.49	8	
N. Williamsburg .....	1.37	7	24	0.56	2	
Sunshine .....	2.32	8	23	0.81	6	Thunder 1st, 6th, 11th and 21st.
<b>NEW BRUNSWICK—</b>						
Point Escomiac .....	1.40	14	17	1.18	17	Thunder 9th.
<b>NOVA SCOTIA—</b>						
Port Morden .....	3.29	10	21	1.35	6, 7	

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF AUGUST, 1902.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria.....	0.00	0.07	0.40	0.66	0.76	0.72	0.81	0.80	0.84	0.84	0.83	0.85	0.77	0.68	0.24	0.00
Nanaimo.....	0.02	0.46	0.74	0.78	0.83	0.87	0.85	0.85	0.80	0.80	0.79	0.77	0.72	0.63	0.42	0.00
Agassiz.....	0.00	0.00	0.28	0.45	0.55	0.62	0.62	0.72	0.75	0.76	0.75	0.77	0.69	0.58	0.17	0.00
Battleford.....	0.35	0.50	0.59	0.67	0.72	0.75	0.80	0.81	0.73	0.76	0.67	0.58	0.47	0.41	0.12	0.00
Indian Head.....																
Brandon.....	0.00	0.33	0.52	0.64	0.72	0.90	0.85	0.87	0.85	0.84	0.84	0.75	0.70	0.19	0.00	0.00
Winnipeg.....	S	0.16	0.47	0.55	0.61	0.65	0.63	0.70	0.63	0.75	0.70	0.69	0.65	0.64	0.41	0.07
Woodstock.....	0.00	0.10	0.53	0.69	0.76	0.81	0.78	0.77	0.77	0.76	0.78	0.81	0.71	0.53	0.09	0.00
Toronto.....	0.00	0.01	0.35	0.71	0.76	0.78	0.72	0.73	0.70	0.74	0.70	0.63	0.68	0.66	0.46	S
Lindsay.....	0.00	0.11	0.41	0.49	0.67	0.73	0.69	0.63	0.66	0.71	0.65	0.51	0.47	0.51	0.45	0.07
Gravenhurst.....	0.00	0.04	0.37	0.57	0.54	0.64	0.64	0.67	0.68	0.73	0.66	0.68	0.71	0.58	0.48	0.10
Barrie.....																
Kingston.....	0.00	0.05	0.50	0.58	0.62	0.65	0.71	0.75	0.66	0.67	0.63	0.73	0.61	0.20	0.00	0.00
Ottawa.....	0.00	0.09	0.50	0.63	0.66	0.69	0.66	0.70	0.71	0.71	0.73	0.72	0.69	0.55	0.12	0.00
Montreal.....	0.00	0.13	0.53	0.60	0.61	0.63	0.68	0.74	0.69	0.69	0.65	0.68	0.56	0.35	0.00	0.00
Fredericton.....	0.00	0.10	0.37	0.48	0.56	0.57	0.59	0.57	0.53	0.53	0.47	0.49	0.45	0.41	0.15	0.00

	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Gravenhurst.	Barrie.	Kingston.	Ottawa.	Montreal.	Fredericton.
Mean proportion for month (Constant sunshine being 1.)	0.66	0.72	0.54	0.63	.....	0.63	0.58	0.64	0.62	0.55	0.57	.....	0.53	0.58	0.62	0.45
Difference from average.....	+ 0.10	-	+ 0.09	+ 0.06	.....	+ 0.05	- 0.01	+ 0.02	+ 0.04	0.02	-	.....	- 0.03	+ 0.07	+ 0.04	- 0.06
Maximum daily amount.....	0.90	0.95	0.86	1.00	.....	0.84	0.91	0.88	0.90	0.97	0.93	.....	0.83	0.90	0.98	0.91
Date.....	6	6	9	21	.....	3	22	4	29	29	9	.....	29	27	13	28
No. of days completely clouded.....	0	1	5	0	.....	0	1	0	0	3	0	.....	0	0	0	6

*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

2. Bowsman, IV.
3. Haileybury, III; Cape Chatte, III.
10. St. Albans, III.
11. Pembina Crossing, IV.
20. Melfort, III.
21. Cape Chatte, I; Savanne.
22. Haileybury, IV; Pembina Crossing, II.
25. Bowsman, IV.
31. Swift Current, IV; St. Albans, II.

*Thunder recorded on :—*

1. Prince Albert, Battleford, Qu'Appelle, Minnedosa, Montreal, Lindsay, Deseronto, Pembina Crossing, Toronto, Duck Lake, *hail*; Manor, Brome, Port Hope, Sunshine, Scarboro', Wyoming, Lansdowne, Georgetown, Bathurst, Belmont.
2. Port Arthur, White River, Bruce Mines, Lakefield, Otonabee, Scarboro', Ursa, Midland, Princeton.
3. Kingston, Parry Sound, Quebec, White River, Swift Current, Banff, Lindsay, Gatesgarth, Haileybury, Gravenhurst, Father Point, Toronto, Alameda, Gray Hill, Manor, Moose Jaw, Shawinigan Falls, Dunnville, Port Dover, Agincourt, Owen Sound, Peterboro', Bala, Welland, *hail*; Weyburn, Dirt Hills, Westport, Huntsville, Providence Bay, Lion's Head, Wyoming, Ursa, Lansdowne, Georgetown.
4. Ottawa, Bermuda, Winnipeg, Truro, Charlottetown, Medicine Hat, Cape Chatte, Percé, Haliburton, Ursa, Arden, Emsdale.
5. Bermuda, Port Stanley, Port Arthur, White River, Truro, Haileybury, London, Halifax, Toronto, Point Clark, Hamilton, Port Dover, Paris, Agincourt, Owen Sound, Lakefield, Lucknow, Brantford, Wiarton, Dealtown, Wyoming, Ursa, Midland, Georgetown.
6. Winnipeg, Quebec, Almasippi, Beatrice, Sunshine.
7. Port Stanley, Quebec, Swift Current, London, Gray Hill, Bon Accord, *hail*; Percé, Point Clark, Ridgetown, Welland, Beaver Hills W., Victoria, Alta; Westminster.
8. Quebec, White River, Banff, St. Agathe, Grand Manan, Yarmouth, Haliburton, Broomhill, Bruderheim, Emsdale, Bathurst, St. John.
9. Truro, Charlottetown, Channel, Percé, Wiarton, Point Escuminac, Moncton.
10. Gravenhurst, Providence Bay, Lion's Head, Stuart Lake.
11. St. Agathe, Haileybury, Gravenhurst, Gray Hill, Bon Accord, Brome, Shawinigan Falls, Uplands, Beaver Hills W., Sunshine, Emsdale.
12. Prince Albert.
13. Bermuda, Truro, Medicine Hat, Grenfell.
14. Pembina Crossing, Shawinigan Falls, Belmont.
15. Swift Current, *hail*; Truro, Okanagan Mission, Alameda, Bon Accord, Moosomin, Okanagan Mission, Weyburn, Broomhill, Beaver Hills W., Bullion.
16. Prince Albert, Barkerville, Calgary, *hail*; Minnedosa, Truro, Okanagan Mission, Yarmouth, Crane Lake, High River, Grenfell, Crescent Lake, Manor, Didsbury, Okanagan Mission, Hillview, Abitibi, Victoria, Alta; Bruderheim, Westport, Channel Island.
17. Bermuda, Prince Albert, Port Arthur, Swift Current, Stony Mountain, Pembina Crossing, Barnardo, Medicine Hat, Crescent Lake, Manor, Moosomin, Oakbank, Almasippi, Whitewood, Weyburn, Dirt Hills, Arden, Belmont.
18. Bermuda, Winnipeg, Minnedosa, Medicine Hat, Alameda, Manor, Estevan, Gatesgarth, Almasippi, Whitewood, Weyburn, Dirt Hills.
19. Estevan, Gatesgarth, Dirt Hill, Wiarton, Scarboro'.

20. Abernethy, Point Clark, Erasmus, Lion's Head, Wyoming, Ursa, Georgetown.
21. Kingston, Montreal, Lindsay, Deseronto, Brome, Lakefield, *violent*: Peterboro', Otonabee, Sunshine, Westport, Croydon, Arden, Rocklyn, Princeton.
23. Bermuda, Yarmouth, Bon Accord, Beaver Hills W., Bruderheim.
24. Battleford, Banff.
25. Bermuda, Quebec, Abernethy, Otonabee, Weyburn.
26. Ottawa, Bermuda, Qu'Appelle, Quebec, White River, Swift Current, Alameda, Melfort, Gatesgarth, Moose Jaw, Brome, Clontarf, Otonabee, Whitewood, Weyburn, Ursa, Dirt Hills, Westport.
27. Bermuda, Qu'Appelle, Chilliwack, Ladner, Medicine Hat, Bon Accord, *hail*: Abernethy, Gatesgarth, Moose Jaw, Whitewood, Weyburn, Dirt Hills, Beaver Hills W., Coquitlam, Arden.
28. Bermuda, Winnipeg, Banff, Oakbank, Bowsman, Belmont.
29. Savanne.
31. St. Johns, Winnipeg, Saugeen, Parry Sound, Minnedosa, Guelph, Haliburton, Beatrice, Lucknow, Erasmus, Beaver Hills W., Norquay, Wiarton, Scarboro', Georgetown, Emsdale, Belmont.

## FORECASTS FOR AUGUST, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1069. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			Percentage
		No. Fully	No. Partly	No. Not	
Manitoba . . . . .	90	77	10	3	91.1
Lake Superior . . . . .	108	88	16	4	88.9
Lower Lake Region . . . . .	105	80	16	9	83.8
Georgian Bay . . . . .	106	83	12	11	81.0
Ottawa Valley . . . . .	102	81	18	3	88.2
Upper St. Lawrence . . . . .	103	82	18	3	88.3
Lower St. Lawrence . . . . .	113	84	23	6	84.5
Gulf . . . . .	117	100	11	6	90.2
Maritime Provinces, West . . . . .	113	98	13	2	92.5
Maritime Provinces, East . . . . .	112	96	12	4	91.0
Total . . . . .	1069	869	149	51	88.3

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,  
*Director.*

Meteorological Office, Toronto,  
26th Sept., 1902.





# Monthly Weather Review.

VOL. XXVI

SEPTEMBER, 1902.

No. 9

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## REMARKS UPON THE WEATHER.

The weather of September in British Columbia was exceedingly bright and fine during the greater portion of the month, and on Vancouver Island and the Lower Mainland summer-like temperatures were maintained until the end of the month. Over the Upper Mainland, although the days were warm up to the 26th, frost at night occurred frequently throughout the month, more especially in northern districts, and in this portion of the province there was comparatively little rain. Heavy snow in the mountains was recorded on or about the 17th. Owing to drouth in some districts vegetation was somewhat injured, but generally it was normal.

In the North west Territories, although the temperature rose almost daily to summer heat up to the last few days of the month, the nights were cool, and at many places frosts were of frequent occurrence. Comparatively little rain fell at most places, and there was much bright sunshine. Plant life was in unusually healthy condition, many plants retaining their bloom until after the 30th.

In Manitoba the weather was unsettled during the first nine days, when there were frequent showers, after which, with the exception of some short periods when showers occurred, it was exceedingly fine and dry. Warm days and cool nights with occasional frost were general. By the 30th vegetation was normal, but many trees were almost denuded of leaves.

The weather in Ontario, though mostly fine and bright in districts east of the Georgian Bay, was exceedingly dull elsewhere, the amount of bright sunshine in Toronto and Lindsay being exceptionally small. East of the County of York the rainfall was comparatively light, but elsewhere showers were frequent throughout the month, and the amount was excessive. Similar inequalities in the temperature also prevailed, the eastern portion of the province being somewhat warmer than usual, whilst the western portion was comparatively cool. Frosts occurred at a few places in northern districts, doing much damage to tender plants, but the condition of vegetation and dates of change in the foliage of trees were normal.

In the Province of Quebec there was much dull weather during the first ten days with occasional showers, after which it was comparatively fine until late in the month, and generally warmer weather than usual prevailed. Light frosts occurred at some places causing slight damage to vegetation, but on the 30th the condition of plant life was normal.

The weather in New Brunswick throughout the greater portion of the month was unusually fine and warm, calms or light winds also occurring almost daily. During the first two weeks there were several heavy showers, thereby swelling the total rainfall which was somewhat excessive in many places. Frosts were reported from a few districts, but vegetation was quite green in many localities on the 30th.

In Nova Scotia the weather conditions were very similar to conditions in New Brunswick, but fresh or strong winds were more frequent, and there was somewhat less sunshine. Throughout the month the change of temperature was unusually small, and although light frosts occurred at a few places, vegetation was little affected.

In Prince Edward Island the weather was somewhat dull, and showers were frequent during the first two weeks, after which it was unusually fine and dry, the total rainfall being less than the average. Comparatively high temperatures continued throughout the month, and this was the only province where hard frosts were not recorded. Vegetation was in excellent condition on the 30th.—F. F. PAYNE.

## ATMOSPHERIC PRESSURE.

The mean pressure for the month was above the average throughout Quebec and the Maritime Provinces, and also over British Columbia, and below average over nearly all the intervening portions of the Dominion,

The largest excess, amounting to one-tenth of an inch, occurred in Eastern Nova Scotia, and an almost similar excess probably occurred in Northern British Columbia. The largest negative departures from average were from six to seven hundredths of an inch in Manitoba and in Western Ontario.

#### HIGH AREAS.

During the first half of the month there were many high areas of a not very pronounced type which passed eastward and south-eastward across the western portion of Canada and the United States, either over or south of the Lake Region, and then usually north-eastward with a decided tendency towards higher pressure. After the 18th there was an obvious change in the type, and there was a tendency, which, in October, became marked, for the highs to develop north of the Great Lakes and move with considerable rapidity and increasing energy south eastward across the St. Lawrence Valley and Maritime Provinces. The most pronounced of the former type was centred within the Lake Region on the 5th, and within the Maritime Provinces on the 6th, and the most marked of the latter type was north of the Great Lakes on the 21th, and to the southward of the Maritime Provinces on the 26th.

#### LOW AREAS.

No. 1 may be traced as a moderate depression from the Canadian North-west Territories across the Upper Lake Region, and thence to the Gulf of St. Lawrence; it was accompanied by heavy showers throughout its course, and at some points on the Great Lakes the wind reached the force of a moderate gale. No. 2 entered British Columbia from the Pacific on the 3rd, and during the 4th and 5th moved slowly across the North-west Territories, accompanied by high winds and local rains; it also occasioned high winds and showers on the Great Lakes during the 6th, and in the St. Lawrence Valley on the 7th, but on this last day it was quickly filling up as its immediate successor developed. No. 3 was first observed in Alberta, whence, during the 7th, it moved quickly eastward to Manitoba, and on the 8th, while centred north of the Lake Superior, caused a moderate south-westerly gale on that lake. A secondary No. 4 developed to the southward during the 8th, and passed across the Lower Lake Region early on the 9th, there giving a rather heavy rainfall; passing eastward it was accompanied by showery weather in Quebec during the 9th, and by strong winds and very heavy rains in the Maritime Provinces during the 10th. No. 5 would appear to have moved south-eastward across the North-west Territories during the 9th, causing strong north westerly winds in its western quadrants. On the 10th, while centred north and east of Manitoba, a strong westerly gale blew in that province. North of the Great Lakes, on the 11th, it was filling up, and by night had nearly disappeared. No. 7 may probably be connected with disturbed conditions which existed over the Gulf of Mexico and Southern States late on the 11th, but its centre cannot be definitely located until the night of the 12th, when just to the south of Lake Erie; it then passed quickly northward across Ontario where a heavy rainfall was followed by a fresh westerly gale. No. 7 was a shallow depression which, during the 13th and 14th, passed from the North-west Territories to Ontario. No. 8 was first observed as a shallow depression over the North west Territories on the 13th, whence accompanied by scattered showers, it moved slowly east and south-east; its maximum intensity was reached on the evening of the 16th as it approached the Great Lakes, over the western portion of which it caused strong winds and local rains. After this it gradually dispersed. Nos. 9 and 10 were both confined to the western part of the continent; the former moved south-east from the Canadian Territories where it was accompanied by scattered showers, and was apparently merged in the latter which first appeared much further south and moved very slowly towards the Lower Lake Region, where, in conjunction with an important high area, it gave strong north-easterly winds and rain on the 24th; it then dispersed. No. 11.—An exceedingly shallow depression over the North-west Territories during the 21st and 22nd. No. 12 was probably a feeble tropical storm which was in evidence off the Atlantic coast during the 20th and 22nd; it passed too far south of Nova Scotia to affect Canadian weather. No. 13 seems to have formed to the northward of the St. Lawrence Valley on the 23rd, and developing rapidly as it passed eastward, was succeeded by a heavy north-westerly gale in the Gulf during the 24th. No. 14 was first observed in British Columbia on the 22nd, moved slowly across the Territories as a fairly deep depression, accompanied by high winds and local showers. On the 25th it seems to have disappeared or was merged in No. 15, which formed further south, and moved directly towards the Lower Lake Region, where, on the 28th, it was accompanied by heavy rain; it then gradually filled in as it neared the Atlantic. No. 16 entered the northern part of British Columbia on the 26th, and moved south-eastward across the Territories and then disappeared. No. 17 originated much further south, approached the Great Lakes on the 30th, there giving fresh winds and a general rainfall. It subsequently passed from the Atlantic Coast considerably south of the Maritime Provinces.

#### BRIGHT SUNSHINE.

In British Columbia the sunshine was considerably in excess of the average, and at Nanaimo the percentage recorded, namely, 67 per cent of the possible amount, was the largest reported from any station in the Dominion. In the North-west Territories and Manitoba the registered amounts were nearly average, while

in Ontario a deficiency was very marked, Lindsay and Toronto registering respectively 35 and 43 per cent of the possible amount, or 18 and 13 per cent below average. Further east the deficiency became gradually less pronounced, and in the Maritime Provinces there was a small but fairly general excess.

### WINDS.

In British Columbia, on Vancouver Island and over the Lower Mainland the direction was chiefly south and west. On five occasions the force of a strong breeze was experienced, and on eleven days the winds were fresh. No gales apparently occurred.

In the North-west Territories the westerly direction largely predominated; strong breezes prevailed on nine occasions, fresh winds on thirteen, and twice the force of a gale was widely experienced.

In Manitoba the westerly direction was also paramount, strong breezes prevailed on ten days, fresh winds on eleven, and there were three gales.

In the Lake Region the direction was westerly on fifteen days, easterly on nine, and at other times variable. There were three days with strong breezes, seventeen with fresh winds, and also there were moderate gales pretty generally recorded on the 4th, 6th and 9th, and locally on the 10th, 13th and 25th. The storm on the 10th was confined to Lake Superior, and the one on the 25th to Lake Erie and the western half of Lake Ontario, and blew from the eastward.

In the Ottawa and St. Lawrence Valleys the direction was westerly on seventeen days, easterly on nine, and at other times variable. There was one day with widespread strong breezes, twelve days of fresh winds, and three moderate gales were recorded.

In the Gulf of St. Lawrence the direction was westerly on seventeen days and largely variable at other times. There were strong breezes on eight occasions, fresh winds on eight, and three gales, the heaviest blow being experienced on the 24th.

In the Maritime Provinces no one direction was strikingly in evidence, variable winds being the rule. There were two days with strong breezes, nine with fresh winds, and on two occasions the force of a gale was reached, but very locally.

The local gales in the Lake Region on the 13th and the gales over the western half of Lake Ontario on the 25th were not warned, neither were the local gales in the Maritime Provinces, but notice was given of the approach of the other storms, which were experienced from the Great Lakes to the Gulf of St. Lawrence.

### TEMPERATURE.

The temperature was above the average in Quebec and the Maritime Provinces, the greatest positive departures occurring in Prince Edward Island and Cape Breton, and amounting from 3 to 4 degrees. In Ontario, from the Georgian Bay District south to Lake Ontario and east to the boundary, it was from average to 2 degrees above; elsewhere from average to 3 degrees below, the greatest negative departures being recorded in the Lake Superior Region. In Manitoba, the Territories and British Columbia it varied from average to 4 degrees below, except at a few points in the extreme southern parts of the Territories and British Columbia where it was from average to 1 degree above. The chief negative departures were at the more northerly stations in British Columbia.

*The Highest and Lowest temperatures in each Province during August, 1902, were:*

British Columbia,	91°·2 on 12th at Alberni,	25°·0 on 25th at Bullion.
North-west Territories,	87°·0 on 7th at Estevan,	10°·0 on 26th at Athabasca Landing.
	87°·0 on 24th at Moose Jaw,	
Manitoba,	86°·0 on 25th at Treherne,	13°·0 on 18th at Bowsman.
Ontario,	86°·0 on 8th at Cottam,	20°·0 on 25th at White River.
Quebec,	84°·0 on 3rd at Richmond,	30°·0 on 6th and 25th at Brome.
New Brunswick,	85°·0 on 1st at Dalhousie,	28°·0 on 26th at Sussex.
Nova Scotia,	84°·0 on 1st at Wolfville,	26°·0 on 26th at Truro.
Prince Edward Island,	81°·0 on 1st at Hamilton.	38°·0 on 25th at Summerside.

### PRECIPITATION.

Precipitation was below the average over the larger portion of British Columbia, but in some localities, including Victoria and New Westminster, it was in excess. In the North-west Territories and Manitoba and eastward to Lake Superior the rainfall was just about half the amount; the more marked local exceptions to this were Calgary with an excess of two-tenths, and Winnipeg, with but a very small deficiency. Over a portion of Ontario the rainfall was in excess of the average, but this was not general, as in the Valleys of the Upper St. Lawrence and Ottawa Rivers there was a decided deficiency. In Quebec and the Maritime Provinces a small excess was fairly general, but there were some localities, including Pictou and Charlottetown, where there was a deficiency.

# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, SEPTEMBER, 1902.

a. Barometer not reduced to Sea Level. • Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	PRESSURE.		TEMPERATURE.				DIRECTION OF WIND FROM						VELOCITY OF WIND			PRECIPITATION.			No. of Rain days.	No. of Auroras.	No. of Foggy.														
			Mean reduced.	Range.	Mean.	Difference from average.	Years observed.	Highest.	Lowest.	Date.	Mean daily range.	Mean relative humidity.	Cloud.	No. of days completely clouded.	Direction of Wind from					Mean miles per hour.				Highest days velocity.	Date and direction from.	Amount.	Difference from Average.	Heaviest fall in month.	Days with 0.1 or more in month.								
															N.	N. E.	E.	S. E.	S.											W.	N. W.	C.	Total number of hours.				
BRITISH COLUMBIA:																																					
Victoria.....	48 24 123 19	85	30.06	30.50	29.71	0.79	50.5	+1.5	11	79.0	11	38.7	28.14	1	4	1	103	54	30	47	75	166	139	35	71	720	6.4	16.2	4 SW	2.31	+0.26	1.15	8.21	0	0	0	
Barkerville.....	53 2 121 35	4180	29.98	30.37	29.52	0.85	43.4	-4.3	14	74.0	12	26.0	17.21	1	6	11	1	30	0	0	1	0	0	0	1	55	60	6.8	6 S	3.70	-0.60	0.60	12.15	0	0	0	
Agassiz.....	49 14 121 31	52	30.00	30.38	29.52	0.86	51.8	-3.7	12	74.0	13	26.0	17.21	1	6	11	1	30	0	0	1	0	0	0	1	55	60	6.8	6 S	3.70	-0.60	0.60	12.15	0	0	0	
Port Simpson.....	54 34 120 26	770	30.00	30.38	29.52	0.86	51.1	-1.7	13	62.0	12	27.1	27.11	1	6	13	0	7	3	11	4	9	4	3	19	60	6.0	24 SE	8.60	-0.06	1.57	21	9	0	1		
Spence's Bridge.....	50 23 121 26	770	30.00	30.38	29.52	0.86	51.1	-1.7	13	62.0	12	27.1	27.11	1	6	13	0	7	3	11	4	9	4	3	19	60	6.0	24 SE	8.60	-0.06	1.57	21	9	0	1		
Hazelton.....	49 3 122 43	1476	30.00	30.38	29.52	0.86	49.5	-	7	78.0	6	25.0	27.31	1	6	13	0	7	3	11	4	9	4	3	19	60	6.0	24 SE	8.60	-0.06	1.57	21	9	0	1		
Revelstoke.....	51 6 118 6	1476	30.00	30.38	29.52	0.86	49.5	-	7	78.0	6	25.0	27.31	1	6	13	0	7	3	11	4	9	4	3	19	60	6.0	24 SE	8.60	-0.06	1.57	21	9	0	1		
Kamloops.....	50 41 120 29	1193	29.93	30.34	29.50	0.84	50.1	-1.1	9	79.0	13	26.0	17.32	1	6	13	0	12	0	65	35	79	39	125	41	321	720	3.3	11.0	19 SW	1.26	-0.37	0.12	8.22	0	0	0
Princeton.....	49 29 120 29	1050	29.93	30.34	29.50	0.84	52.0	-	11	79.0	13	26.0	17.32	1	6	13	0	12	0	65	35	79	39	125	41	321	720	3.3	11.0	19 SW	1.26	-0.37	0.12	8.22	0	0	0
Pilot Bay.....	49 39 116 55	20	30.00	30.38	29.52	0.86	51.8	-3.7	12	74.0	13	26.0	17.21	1	6	11	0	1	2	3	11	0	1	6	0	66	90	1	11	25 SE	10.08	-	1.78	16.14	0	0	0
River's Inlet.....	51 39 121 19	20	30.00	30.38	29.52	0.86	51.8	-3.7	12	74.0	13	26.0	17.21	1	6	11	0	1	2	3	11	0	1	6	0	66	90	1	11	25 SE	10.08	-	1.78	16.14	0	0	0
Stuart Lake.....	54 2 121 12	1800	30.00	30.38	29.52	0.86	51.8	-3.7	12	74.0	13	26.0	17.21	1	6	11	0	1	2	3	11	0	1	6	0	66	90	1	11	25 SE	10.08	-	1.78	16.14	0	0	0
French Creek.....	49 20 124 36	1246	30.00	30.38	29.52	0.86	53.6	-1.5	10	80.0	12	33.0	28.21	1	6	13	0	1	2	3	11	0	1	6	0	66	90	1	11	25 SE	10.08	-	1.78	16.14	0	0	0
Goldstream.....	50 14 119 15	1246	30.00	30.38	29.52	0.86	53.6	-1.5	10	80.0	12	33.0	28.21	1	6	13	0	1	2	3	11	0	1	6	0	66	90	1	11	25 SE	10.08	-	1.78	16.14	0	0	0
Nanaimo.....	49 10 123 57	21	29.93	30.28	29.51	0.77	55.6	-	2	83.2	12	34.0	28.21	1	6	13	0	6	4	10	16	2	1	15	29	16	90	10.3	25.3	8 SW	1.00	-	0.45	8.22	0	0	0
Chilliwack.....	49 10 121 57	21	30.06	30.42	29.68	0.76	56.2	-	7	85.0	12	35.0	31.5	4	6	13	0	2	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	4.14	-2.23	1.19	11.19	0	0	0
Port Roberts.....	50 32 128 3	1800	30.00	30.38	29.52	0.86	53.1	-	7	74.0	12	40.0	17.13	1	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	7.08	-	1.80	15.14	0	0	0
Midway.....	49 6 118 46	1800	30.00	30.38	29.52	0.86	53.1	-	7	74.0	12	40.0	17.13	1	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	7.08	-	1.80	15.14	0	0	0
Endicott.....	50 32 119 7	1180	30.00	30.38	29.52	0.86	51.9	-	7	79.0	14	30.0	20.25	4	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	0.94	-0.31	0.32	8.21	0	0	0
Nicola Lake.....	46 9 120 39	2120	30.00	30.38	29.52	0.86	52.4	-	7	76.1	6	31.0	28.21	4	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	1.18	-	1.54	7.23	0	0	0
West Kootenay.....	49 20 117 50	1700	30.00	30.38	29.52	0.86	52.4	-	7	76.1	6	31.0	28.21	4	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	1.43	-	1.47	7.23	0	0	0
Garry Point.....	49 21 123 17	2000	30.00	30.38	29.52	0.86	51.5	-	7	83.1	12	26.0	2.32	5	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.43	-	2.15	7.23	0	0	0
Tobacco Plains.....	49 17 123 5	195	30.00	30.38	29.52	0.86	51.7	-	7	83.1	12	26.0	2.32	5	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	3.43	-	3.84	8.21	0	0	0
Vancouver.....	49 17 123 5	195	30.05	30.37	29.63	0.68	55.9	-1.3	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
New Westminster.....	49 13 122 54	330	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
North Vancouver.....	49 5 123 4	330	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
North Nicomen.....	49 12 122 2	330	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
Quesnelle.....	52 59 122 30	1700	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
Clayoquot.....	49 11 125 17	40	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
Chamorro.....	49 30 115 50	30	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
Massett.....	53 58 125 9	30	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
Bullton.....	52 45 121 55	30	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
Bella Gorda.....	52 40 126 54	150	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
Duncan.....	48 45 123 42	40	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
Nelson.....	49 20 117 51	21	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12	1	0	84	11.5	15.0	4 W	2.70	-	1.50	5.25	0	0	0
Maasau.....	49 20 117 51	21	30.10	30.32	29.80	0.52	52.6	-	10	84.0	12	30.0	25.95	6	6	13	0	7	3	21	4	16	25	12													







PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
SEPTEMBER, 1902.

STATIONS.	RAINFALL.					REMARKS.
	Amount in inches.	No. of Days <sup>or</sup> Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.	
BRITISH COLUMBIA—	in.			in.		
Kuper Island .....	1 27	7	23	0 73	26	24th, thunder; 25th, light frost.
Nas Harbour .....	10 07	20	10	2 12	20	20th, heavy rain and S.E. gale.
Port Essington .....	14 18	24	6	2 37	21	
Goldstream Lake .....	3 24	9	21	2 02	26	
Caulfields .....	3 18	10	20	1 88	26	
Nanaimo City .....	1 26	7	23	0 51	26	
Royal Oak .....	2 79	6	24	1 02	25	
Cogitlam .....	3 77	5	25	2 95	26	
N. W. TERRITORIES—						
Innisfail .....	0 72	7	23	0 18	6	18th, snow; 25th, snow to cover ground.
Cardston .....	1 35	3	27	0 40	17	16th, 2½ inches snow.
Whitewood .....						No rain.
Weyburn .....	0 38	6	24	0 22	7	Frost 4th, 11th, 12th, 16th, 17th and 18th.
Diet Hills .....	0 80	5	25	0 28	5	Fog on 11th, 16th and 20th.
Stirling .....	0 56	2	28	0 56	13 14	
Victoria .....	1 10	3	27	1 02	4	Sleet 19th and 16th.
Bruderheim .....	1 23	10	20	0 82	4	17th, heavy frost; 21st, thunder and hail.
Beaver Hills, W. .....	1 26	9	21	0 45	4	Thunder 4th, 6th and 21st; 15th, first frost; 16th, sleet; 19th, snow.
Broomhill .....	1 50	6	24	0 46	3	19th, snow.
Beaver Hills, E. ....	1 13	4	25	0 41	19	14th, snow.
MANITOBA—						
Norquay .....	1 35	8	21	0 68	20	20th, snow.
Dauphin .....	0 17	3	27	0 10	29	Frost 4th; 17th, ice.
Cartwright .....	0 81	7	23	0 41	4	Month extremely windy.
Morden .....	0 81	2	25	0 61	19	12th, 6 of frost.
Belmont .....	0 81	6	24	0 43	5	Thunder on 19th.
ONTARIO—						
Wooler .....	2 01	8	22	0 67	9	Thunder 7th, 9th and 30th; tender vines green yet.
Aurora .....	2 79	10	20	0 96	12	
Croydon .....	1 76	3	27	0 83	9	Frost 6th and 14th; thunder 7th and 22nd.
Lion's Head .....	3 51	12	18	1 20	14	Thunder 1st, 4th and 10th.
Dutton .....	2 96	6	24	1 50	15	
Deer Park .....	2 65	8	22	0 82	28	
Warton .....	4 89	15	15	1 26	12	Thunder 1st, 3rd, 6th and 22nd.
Providence Bay .....	2 44	13	17	0 65	12	Thunder 3rd and 6th; fog 26th and 29th.
Lynedoch .....	3 42	6	24	1 03	11	
Emismore .....	2 64	3	27	1 37	8	
Oliver's Ferry .....	2 00	9	21	0 60	28	
Sunshine .....	3 04	13	17	1 10	13	7th, first ice.
Westminster .....	4 17	11	19	1 71	12	
Montague .....	1 16	6	24	0 43	9	Dry and cool.
Smith's Falls .....	1 61	7	23	0 56	9	Frost 13th and 14th.
Ursa .....	4 43	15	15	1 33	9	Thunder 2nd, 3rd, 6th, 9th and 12th; frost 4th.
Huntsville .....	3 77	9	21	0 90	13	
Dealtown .....	6 09	10	20	1 99	24	
Scarboro' .....	2 83	10	15	0 62	9	Thunder 1st, 7th and 9th; frost 5th and 14th.
Goderich .....	4 83	10	20	1 40	12	
Nottawasaga .....	2 30	8	22	2 30	8	Thunder 1st; fog 26th, 27th, 28th and 29th.
Orangeville .....	3 58	11	19	1 22	13	
Port Burwell .....	4 60	11	19	1 20	24	
N. Williamsburg .....	1 08	6	24	0 49	9	
Craigleith .....	4 29	13	17	1 86	12	
Watford .....	4 58	9	21	1 40	12	
Arden .....	1 94	12	18	0 90	10	Thunder 1st, 10th and 23rd.
Georgetown .....	3 09	15	13	1 09	12 13	Thunder 1st, 6th, 9th and 12th; fog on 8 days.
Wyoming .....	5 77	11	19	1 05	12	Thunder 1st, 6th and 9th; frost 14th.
Uxbridge .....	2 12	9	21	0 83	9	Thunder 9th; frost on 5th.
Midland .....	4 11	15	15	1 21	12	Thunder 8th; heavy frost 5th.
Westport .....	1 60	7	23	0 50	30	Fog on 25th, 26th, 27th, 28th, 29th and 30th.
Jermyn .....	2 18	6	24	1 30	9	Thunder 7th, 9th and 22nd.
Parnia .....	1 80	5	25	0 66	8	
Princeton .....	1 04	13	17	0 95	13	
Cayuga .....	2 31	6	19	0 62	10	Frost 5th and 6th; thunder 7th.
Lansdowne .....	1 04	3	27	0 65	9	
Emsdale .....	4 55	13	17	1 33	13	Thunder 3rd and 5th.
NEW BRUNSWICK—						
Point Escommac .....	2 25	8	22	1 11	10	Fog 20th, 29th and 30th.
NOVA SCOTIA—						
Port Morden .....	3 74	7	23	1 31	30	



*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

1. Aweme, III : Bowsman, IV.
2. White River, II : Cape Chatte, III.
3. Bowsman, IV.
5. White River, II.
6. Barnardo, II : Aweme, III.
10. Melfort, IV.
12. Melfort, II.
22. Aweme, III : Hillview, III : Bowsman, III.
28. Bowsman, IV.

*Thunder recorded on :—*

1. Parry Sound, Quebec, Woodstock, Stratford, Gravenhurst, Lindsay, Guelph, Toronto, Lion's Head, Wiarton, Scarboro', Nottawasaga, Arden, Georgetown, Wyoming, Stony Creek, Erasmus, Meaford, Beatrice, Peterboro', Orillia, Hamilton, Agincourt.
2. Truro, Ursa, Peterboro', Moncton, Grand Manan, Sydney.
3. Parry Sound, Gravenhurst, Lion's Head, Wiarton, Providence Bay, Emsdale, Beatrice, Point Clark, Haliburton, Orillia, Abitibi, Haileybury, Bruce Mines.
4. Quebec, W. Beaver Hills, Peterboro', Glacier, Brome, Chicoutimi, Shawinigan Falls.
5. Pembina Crossing, Emsdale.
6. Parry Sound, Stratford, Guelph, Toronto, Wiarton, Ursa, Georgetown, Wyoming, Cayuga, W. Beaver Hills, Erasmus, Meaford, Dunnville, Point Clark, Cockburn Island, Bon Accord, Glacier, Haileybury, Agincourt.
7. Prince Albert, Saugeen, Quebec, Montreal, Pembina Crossing, London, Lindsay, Deseronto, Wooler, Croydon, Scarboro', Jernyn, N. Bruce, Clontarf, Shawinigan Falls.
8. Port Stanley, Midland.
9. Parry Sound, Woodstock, Gravenhurst, Lindsay, Deseronto, Guelph, Toronto, Scarboro', Georgetown, Wyoming, Uxbridge, Emsdale, Owen Sound, N. Bruce, Dunnville, Kinmount, Beatrice, Point Clark, Port Hope, Haliburton, Lakefield, Clontarf, Agincourt.
10. Port Stanley, Lion's Head, Arden.
12. Ursa, Georgetown, Kinmount, Port Hope.
15. Clontarf.
16. Port Arthur, Pembina Crossing.
17. White River.
19. Pembina Crossing, Cartwright.
20. Norquay.
21. Bruederheim, W. Beaver Hills, N. Bruce, Haileybury.
22. Croydon, Wiarton, Jernyn, N. Bruce, Port Hope, Brome.
23. Ottawa, Quebec, Montreal, Arden, Port Hope, Vankleek Hill, Lakefield, Brome.
24. Kuper Island.
26. Chaplin.
27. Bowsman.
28. Port Stanley, Dunnville.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF SEPTEMBER, 1902.

## HOURS ENDING.

	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria	0 00	0 05	0 41	0 67	0 68	0 74	0 69	0 71	0 67	0 64	0 65	0 57	0 28	0 01		
Nanaimo	0 07	0 40	0 66	0 74	0 76	0 79	0 78	0 75	0 75	0 75	0 75	0 69	0 32	T		
Agassiz	0 00	0 00	0 13	0 39	0 49	0 50	0 51	0 57	0 57	0 57	0 53	0 33	0 14	0 00		
Battleford	0 01	0 21	0 40	0 56	0 60	0 64	0 64	0 52	0 71	0 67	0 58	0 43	0 25	0 07	0 00	
Indian Head	0 00	0 01	0 03	0 36	0 54	0 54	0 56	0 64	0 60	0 67	0 59	0 23	0 00	0 00		
Brandon	0 01	0 50	0 64	0 73	0 66	0 66	0 64	0 59	0 54	0 58	0 43	0 20	0 00	0 00		
Winnipeg	0 01	0 20	0 41	0 61	0 69	0 74	0 71	0 70	0 64	0 69	0 44	0 32	0 03	0 00		
Woodstock	0 00	0 11	0 34	0 44	0 49	0 52	0 56	0 53	0 49	0 46	0 42	0 34	0 19	0 03		
Toronto		0 08	0 33	0 49	0 55	0 53	0 57	0 58	0 53	0 51	0 45	0 42	0 28	0 04		
Lindsay	0 03	0 23	0 27	0 37	0 44	0 52	0 51	0 51	0 45	0 41	0 22	0 20	0 20	0 03		
Barrie																
Gravenhurst		0 16	0 26	0 43	0 43	0 44	0 48	0 46	0 45	0 43	0 36	0 30	0 17	0 11		
Kingston		0 01	0 29	0 51	0 50	0 61	0 60	0 67	0 59	0 62	0 60	0 59	0 08	0 00		
Ottawa		0 07	0 26	0 49	0 58	0 50	0 51	0 48	0 49	0 53	0 49	0 35	0 09	0 00		
Montreal		0 17	0 32	0 48	0 53	0 55	0 59	0 61	0 63	0 55	0 53	0 40	0 01	0 00		
Quebec		0 00	0 12	0 48	0 57	0 54	0 51	0 55	0 49	0 51	0 49	0 12	0 00	0 00		
Fredericton		0 15	0 34	0 43	0 54	0 56	0 58	0 62	0 63	0 62	0 56	0 52	0 33	T		

	Victoria	Nanaimo	Agassiz	Battleford	Indian Head	Brandon	Winnipeg	Woodstock	Toronto	Lindsay	Barrie	Gravenhurst	Kingston	Ottawa	Montreal	Quebec	Fredericton
Mean proportion for month (Constant sunshine being 1.)	0 55	0 67	0 38	0 50	0 38	0 49	0 49	0 41	0 43	0 35		0 35	0 44	0 39	0 49	0 35	0 48
Difference from average.	0 16	—	0 07	0 03	0 02	0 01	0 02	0 08	0 13	0 18		—	0 07	0 05	0 05	—	0 00
Maximum daily amount	0 85	0 94	0 80	0 97	0 69	0 84	0 83	0 91	0 92	0 96		0 94	0 80	0 88	0 98	0 72	0 94
Date.	10	2	13	12	6	22	13	7	2	5		2	3	5	8	24	11
No. of days completely clouded	4	3	16	4	2	3	3	9	4	7		8	4	5	5	7	4

## FORECASTS FOR SEPTEMBER, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1,049. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	90	65	14	11	80.0
Lake Superior.....	106	80	21	5	85.4
Lower Lake Region.....	120	92	22	6	85.8
Georgian Bay.....	119	101	11	7	89.5
Ottawa Valley.....	100	84	16	10	87.0
Upper St. Lawrence.....	101	84	11	6	88.6
Lower St. Lawrence.....	104	82	11	11	84.1
Gulf.....	104	81	12	11	83.7
Maritime Provinces, West.....	103	82	12	9	85.4
Maritime Provinces, East.....	102	86	4	12	86.3
Total.....	1,049	837	124	88	85.7

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,  
*Director.*

Meteorological Office, Toronto,  
28th October, 1902.





# Monthly Weather Review.

VOL. XXVI

OCTOBER, 1902.

No. 10

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## REMARKS UPON THE WEATHER.

The weather of October in Vancouver Island was extremely fine and dry up to the 12th after which it became unsettled and rain was recorded on ten days at most places. In this portion of British Columbia the maximum temperature of the day was generally between 55° and 65°, the minimum was frequently below 40°, and after the 20th frost occurred in many localities. Over the lower mainland the weather conditions were very similar to conditions on the islands, but clouded skies, fog and rain were more frequent after the 13th. Over the upper mainland the weather was mostly fine and dry up to the 14th, after which it was somewhat unsettled, but rain was much less frequent than elsewhere and in some districts not any occurred until after the 21st. On the higher levels frost was noted almost daily whilst in the valleys it was only recorded occasionally. Altogether the weather was finer and drier than usual and vegetation remained green to an unusually late date.

In the Northwest Territories the weather was unusually fine, mild and dry throughout the greater portion of the month, these conditions being more marked in Saskatchewan and Assinibia where the rainfall of the month was extremely light at most places, and in some districts not any was recorded. Some snow fell at a few stations on or about the 10th and 24th but it soon disappeared. Up to about the 8th the temperature exceeded 70° upon several occasions, after that date, however, there was a marked drop and 60° was only exceeded on a few days. Frosts occurred almost daily throughout the month but many hardy plants remained green until late in the month and some were still in bloom on the 31st in Alberta.

In Manitoba the weather conditions were very similar to conditions in the Territories excepting with regard to the amount of sunshine which was normal in eastern districts and only slightly above in the western portion of the province, also with regard to the precipitation the total of which at many places was somewhat greater than in the Territories. Light snow was recorded in some districts upon several days and the nights were cold; nevertheless the trees retained their leaves and some plants remained in bloom to an unusually late date.

The weather conditions of the western portion of the Dominion were reversed in Ontario, the rainfall being generally excessive and the temperature and sunshine deficient. In south-western districts, however, the rainfall was somewhat lighter than usual. In many localities the weather was dry from the 2nd to the 5th, 9th to 12th and 14th to 17th, but this was by no means general, dry periods being much more extended in south-western districts and rain falling almost daily at some places elsewhere. Several heavy thunderstorms occurred after the 17th but little damage was caused thereby. Snow fell quite frequently in northern districts after the 20th but it was only recorded at a few places in the more southern portion of the province. Frosts were of frequent occurrence and the trees were denuded unusually early.

In the Province of Quebec the weather conditions were similar to conditions in Ontario, the sunshine being deficient, low temperatures prevailing, and rain being generally frequent and excessive, excepting at Montreal and a few other places where on the contrary it was somewhat deficient. Thunderstorms were recorded in many districts on or about the 13th and 20th. Snow occurred at a few places late in the month and frosts were frequent. In most districts the trees were bare at an earlier date than usual.

The weather in New Brunswick continued comparatively warm up to the 9th when there was a marked fall in the temperature, and although 60° to 65° was recorded on several days after the 8th and the mean was slightly above the average in the south-western portion, it remained generally cool elsewhere. In most districts

there was much bright sunshine and in some places the rainfall was deficient, but generally the precipitation was unequally distributed and exceeded the average in many localities. Gales occurred on the 24th and 28th and snow was recorded on the 8th and 27th at some stations. Frosts were not so frequent as in more western provinces and vegetation was generally in normal condition.

In Nova Scotia although the weather was rather milder than usual along the Atlantic Coast, it was generally somewhat cooler elsewhere, the temperature falling considerably after the 8th. In most districts the rainfall was light, but at a few places it somewhat exceeded the average. Clear weather occurred quite frequently and there was comparatively little fog. A heavy gale occurred on the 28th, causing several marine disasters. Snow was recorded on the 9th, and after the 16th frost was of frequent occurrence. Vegetation was normal on the 31st.

The weather in Prince Edward Island did not depart much from the normal, but the precipitation was comparatively light and high winds were unusually frequent. After the 9th there were frequent low temperatures, more especially in eastern districts, frost occurring generally on many days after the 16th. Vegetation was in normal condition on the 31st.—F. F. Payne.

### ATMOSPHERIC PRESSURE.

In Canada the mean atmospheric pressure was higher than the normal over the western half of the region of the Great Lakes, and thence westward to Assiniboia, and northward to an unknown distance; it was also slightly above normal over south-western Nova Scotia. It was below normal from eastern Ontario to the Gulf of St. Lawrence, and also from western Assiniboia to the Pacific Coast. The largest positive departure was about +0.5 of an inch north of Lake Superior and Manitoba, and the largest negative departure was about -0.5 over the northern portion of the Gulf.

### HIGH AREAS.

Ten areas of high pressure have been traced over either a portion or the whole breadth of the continent. The first was comparatively feeble and took from the 1st to the 5th to pass from the Pacific to Atlantic, its course being from Washington Territory and across the Great Lakes. There were four other areas which appear to have originated over the western States or further west; three of these moved across the southern States and thence to the Atlantic. Five areas were first observed either over or to the northward of Manitoba and in each case these areas developed as they moved south-eastward across either the Great Lakes or St. Lawrence Valley, and were accompanied by sharp frosts from Ontario to the Maritime Provinces.

### LOW AREAS.

Eleven areas of low pressure were charted, of these nine moved out of range of observation from Newfoundland, or between latitudes 45° and 55°. Their origins were various, five being from the north-west, three from the south-west and three from the south.

No. 1 was near the middle Atlantic Coast on the morning of the 1st; it moved rapidly north-eastward and passed to the south of Newfoundland on the morning of the 2nd. It caused light rains in the Maritime Provinces, but only moderate to fresh winds were reported. No. 2 can be traced from the Gulf of California, whence it moved between the mornings of the 2nd and 5th to the Lake Region, where on that date it caused some heavy showers with violent local thunderstorms which also prevailed in its course down the St. Lawrence Valley. This area was of moderate energy and eventually moved off the Newfoundland coast on the morning of the 9th. No. 3 was a very shallow depression which moved quickly across the North-west Territories on the 7th, and during the 8th south-eastward across the Great Lakes and then off the New England Coast; the important features in connection with this area were the fact of its being immediately followed by the most important high of the month and that an area of heavy rainfall of small dimensions accompanied the low in its north-eastern quadrant and a narrow zone of rain can be traced from Lake Superior across the Ottawa Valley and over the south-western portion of the Maritime Provinces. No. 4 first appeared in the Gulf of Mexico and between the mornings of the 11th and 13th moved across Georgia, the Carolinas and Virginia to the Atlantic; it then moved up the coast and passed out to sea south of Newfoundland. This area caused rain and moderate to fresh winds in Nova Scotia. No. 5 was present on the morning of the 12th in Arizona, and passed across the continent in a north-easterly direction, being centred near Sault Ste. Marie on the morning of the 13th, and over Newfoundland on the 15th. From the Great Lakes to the Gulf of St. Lawrence it was accompanied by gales and rain. No. 6 was first noted over Athabasca; thence it passed between the 13th and 17th in a general easterly direction to Newfoundland and out to sea. It caused moderate gales with showers from Ontario to the Atlantic. No. 7 followed nearly the same track as its predecessor; while passing north of the Great Lakes and St. Lawrence Valley it gave showers in Ontario on the 18th and in Quebec on the 19th,

and as the centre passed towards Newfoundland on the 20th there was a strong north-westerly gale in the Gulf. No. 8. This area may perhaps be identified with a low which was near the north Pacific Coast on the 21st, and seems to have moved south-eastward. On the 23rd, the centre of disturbance was in South Dakota, whence it passed to Lake Superior, and then, during the 24th eastward across northern Ontario and Quebec while in both provinces moderate gales and showery weather were prevalent. On the 25th it drew north-eastward across the Gulf of St. Lawrence where showers were followed by a strong north-westerly and northerly gale. No. 9 appears to have originated near the middle Pacific Coast; it was approaching Lake Superior on the 25th, while rain fell in Manitoba and rain and easterly gales became prevalent over the western portion of the Great Lakes. During the 27th and 28th it passed away to the northward of Ontario and Quebec the weather continuing showery in both provinces. No. 10 travelled from the Gulf of Mexico up the Atlantic Coast and over New Brunswick to the Straights of Belle Isle; it was shown on the chart between the 26th and 30th, and caused heavy rains with fresh south-west to west gales on the 28th in the Gulf of St. Lawrence and in the Maritime Provinces. No. 11. On the 28th an area of low pressure appeared near the north British Columbia coast, and during the next few days spread eastward across our more northern Territories; a barometric disturbance, which on the 30th passed quickly across the Great Lakes, accompanied by rain and on the 31st gave showers in Quebec, may possibly have been a subsidiary to the main area.

### BRIGHT SUNSHINE.

Bright sunshine was in excess of the average from Manitoba westward to the Pacific and less than the average amount was recorded from Winnipeg eastward over Ontario and Quebec. The Fredericton record would indicate a fairly general excess in the Maritime Provinces. The highest records were 53 and 49 per cent of the possible amount at Battleford, Sask., and Fredericton, N.B., being respectively 15 and 5 per cent higher than the average, and the lowest records were 29 at Ottawa and 31 at Kingston, respectively 8 and 10 per cent less than average amount.

### WINDS.

In British Columbia, on Vancouver Island and the Mainland light to moderate variable winds obtained during nearly the whole month, the force of a fresh breeze was seldom reached, and on only two occasions was a strong breeze recorded.

In the North-west Territories the directions were also largely variable, the south and west being if anything most in evidence. The force of a fresh breeze was recorded on eighteen days, and a strong breeze on four days, but there were no gales.

In the Lake Region the directions were largely westerly and northerly. There were eight days with fresh breezes, twelve with strong, and the force of a gale was reached on the 13th, 24th, 27th and 30th.

In the Ottawa and St. Lawrence Valleys, the direction was chiefly westerly and northerly. There were eleven days with fresh breezes, nine with strong, and on the 13th and 24th, the force of a gale was attained.

In the Gulf of St. Lawrence the direction was very largely westerly and northerly. There were ten days with fresh breezes and seven with strong, besides seven gales, the latter occurring as follows on the 4th, 8th, between the 13th and 14th, the 16th, between the 20th and 21st, the 25th, and between the 28th and 29th.

In the Maritime Provinces the direction was almost entirely westerly and northerly. There were fifteen days with fresh breezes, ten with strong breezes, and the force of a gale was reached between the 24th and 25th and on the 28th.

In the Lake Region the gale of the 24th was only warned on Lake Superior and the gale of the 30th was not warned. In the Gulf of St. Lawrence the gales of the 4th, 16th and 21st were not warned. All the other gales occurring in the several districts were duly warned.

### TEMPERATURE.

The temperature was above average from the Pacific Coast to the western boundary of the Lake Superior district, the largest excess being between three and four degrees in Assiniboina and Alberta. In eastern Quebec and the Maritime Provinces it was very nearly average, departures in either direction not exceeding one degree. Near the western end of Lake Ontario the temperature exceeded the average by a fraction of a degree but over the larger portions of both Ontario and Quebec it was below average, the largest negative departures being about three degrees over the more northern districts.

*The Highest and Lowest temperatures in each Province during October, 1902, were :*

British Columbia,	74° 0 on 5th at Matsqui,	16° 0 on 24th at Cranbrook.
North-west Territories,	82° 4 on 5th at Lethbridge.	5° 0 on 18th at Abernethy.
Manitoba,	76° 5 on 5th at Point in a Crossing.	9° 0 on 20th at Bowsman.
Ontario,	78° 0 on 6th at Cottam,	10° 0 on 16th at Savanne
Quebec,	77° 0 on 1st at Richmond,	15° 5 on 29th at Richmond.
New Brunswick,	72° 6 on 2nd at St. Stephen.	13° 0 on 24th at Sussex.
Nova Scotia,	71° 8 on 7th at Halifax.	19° 3 on 24th at Wolfville.
Prince Edward Island,	66° 2 on 7th at Charlottetown.	22° 8 on 27th at Summerside.

#### PRECIPITATION.

The precipitation was very generally less than average in British Columbia and throughout the North-west Territories and Manitoba ; in very few localities was there an excess. In the former province the amounts recorded were in many instances about half the average, and in many parts of the Territories there was either none or but a few tenths of an inch. In Ontario and Quebec there was a pretty general excess, exceptions being in the District near Lake Erie and in the vicinity of Montreal. Portions of New Brunswick had a small excess, but over the southern part of that province and very generally in Nova Scotia and Prince Edward Island there was a pronounced deficiency.



## PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, OCTOBER, 1902.

a. Barometer not reduced to Sea Level. • Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	PRESSURE.		TEMPERATURE.		DIRECTION OF WIND FROM					VELOCITY OF WIND.		PRECIPITATION.		No. of Fogs.																			
			Mean reduced.	Range.	Mean.	Difference from average.	Highest.	Date.	Lowest.	Date.	Mean daily.	Mean temperature of day.	Mean relative humidity.	Cloud.	No. of days completely clouded.		N.	E.	S.	W.	N. W.	C.	Mean miles per hour.	Highest velocity.	Direction from.	Amount.	Difference from Average.	Heaviest fall in month.	Days with 1/10 or more.	No. of Fair days.	No. of Auroras.	No. of Thunder storms.			
BRITISH COLUMBIA:																																			
Victoria	48 24 123 10	123 10	29.99 30.31	29.68 0.63	32.4	2.7 11.70 4	3	38.7	19 11 0	12	231	104	48	52	76	59	18	36	744	4.5	11.3	28 W	1.09	1.27 0.58	13 16 0 0 9	0	0	0	0	0	0	0	0	0	0
Barkerville	53 23 121 33	121 33	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Agassiz	49 11 121 33	121 33	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Port Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91	1.76 0.30	6 21 0 0 0	0	0	0	0	0	0	0	0	0	0
Fort Simpson	51 21 121 36	121 36	29.95 30.29	29.30 0.70	40.3	1.8 14.52 0	3	16.6	26 18 7	4	3	0	0	0	1	1	0	0	57	63	7.0	28 S	0.91</												



ONTARIO.—*Cont.*

Sarnia	14 30	81	21	556	30 04 30	46 29 39	1 07	47 7	0	3 26 39	2	25	0	0	17 15 9	.....	6	4	159	41	60	59	129	104	73	112	7	744	12 1	26 7	13 SW	3 82	—	0 61 103	16 15	0	0	
Owen Sound	41 24	50 55	.....	567	.....	.....	.....	41 1	—	0 1 23 39	0	11	14 8	0	10 12 9	.....	.....	.....	0	10	14	6	3	8	33	5	14	0	93	.....	4 97	—	1 71 154	16 15	0	0		
Uxbridge	43 45	79 25	.....	.....	.....	.....	.....	41 2	—	1 2 16 37	0	11	14 8	0	10 12 9	.....	.....	.....	0	0	0	3	3	0	15	14	0	0	93	.....	4 97	—	0 58 0 40	16 15	0	0		
Toronto	43 40	79 17	.....	350	30 07 30	48 29 48	1 00	48 4	—	0 6 17 18 1	19	26	4	0	26 4	41 5	79	6	4	47	52	129	12	35	82	103	184	10	741	11 8	27 2	13 SW	3 82	—	0 57 1 08	16 15	0	0
Welland	43 59	79 17	.....	.....	.....	.....	.....	48 4	—	0 6 17 18 1	19	26	4	0	26 4	41 5	79	6	4	47	52	129	12	35	82	103	184	10	741	11 8	27 2	13 SW	3 82	—	0 57 1 08	16 15	0	0
Peterborough	44 17	78 45	.....	722	.....	.....	.....	48 4	—	0 6 17 18 1	19	26	4	0	26 4	41 5	79	6	4	47	52	129	12	35	82	103	184	10	741	11 8	27 2	13 SW	3 82	—	0 57 1 08	16 15	0	0
Lindsay	44 20	78 45	.....	.....	.....	.....	.....	48 4	—	0 6 17 18 1	19	26	4	0	26 4	41 5	79	6	4	47	52	129	12	35	82	103	184	10	741	11 8	27 2	13 SW	3 82	—	0 57 1 08	16 15	0	0
Deseronto	44 21	77 1	.....	294	.....	.....	.....	48 4	—	0 6 17 18 1	19	26	4	0	26 4	41 5	79	6	4	47	52	129	12	35	82	103	184	10	741	11 8	27 2	13 SW	3 82	—	0 57 1 08	16 15	0	0
Lakefield	44 25	81 15	.....	.....	.....	.....	.....	48 4	—	0 6 17 18 1	19	26	4	0	26 4	41 5	79	6	4	47	52	129	12	35	82	103	184	10	741	11 8	27 2	13 SW	3 82	—	0 57 1 08	16 15	0	0
Belleville	44 25	81 15	.....	.....	.....	.....	.....	48 4	—	0 6 17 18 1	19	26	4	0	26 4	41 5	79	6	4	47	52	129	12	35	82	103	184	10	741	11 8	27 2	13 SW	3 82	—	0 57 1 08	16 15	0	0
Kinston	44 13	76 21	.....	585	30 02 30	41 29 46	0 38	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Chatham	45 23	72 42	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Ottawa	45 23	72 42	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Bischoff	46 9	78 6	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Carleton	46 10	80 40	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Stratford	45 59	82 4	.....	586	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Sturdivant	45 59	82 4	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Lacknow	45 56	81 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
White River	45 56	81 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Port Arthur	45 56	81 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Stony Creek	45 56	81 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Oranburg	45 56	81 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Windor	45 56	81 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Alton	45 56	81 30	.....	1250	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	45 56	81 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
North Bruce	44 23	81 25	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Collingwood	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Rockton	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Whitby	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Orillia	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Collingwood	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2	62	.....	4 21	—	1 05 0 78	16 15	0	0	
Georgetown	44 20	80 30	.....	.....	.....	.....	.....	47 8	—	0 9 14 70	0	21	22	1	20 18 1	.....	.....	.....	6	3	13	13	1	2	7	12	7	5	2									

## PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, OCTOBER, 1902.

a Barometer not reduced to Sea Level. \* Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above Sea Level, in feet.	PRESSURE.			TEMPERATURE.			DIRECTION OF WIND FROM						VELOCITY OF WIND			PRECIPITATION			Days with 0.1 or more in. of rain.	No. of Thunderstorms.									
				Mean Reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Highest.	Lowest.	Date.	Mean daily range.	Mean temperature of day.	Mean amount of cloud.	No. of days completely clouded.	N.	N.E.	E.	S.E.	S.			W.	N.W.	Total number of hours.	Mean miles per hour.	Highest velocity.	Date and direction from.	Amount.	Difference from average.	Heaviest fall in month.
NEW BRUNSWICK.																																
Cape Charlotte	49° 06' 45"	66° 45'	164	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Beauport	48° 55' 30"	66° 45'	231	29.95	30.50	29.50	1.00	29.95	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Cape Magdalen	49° 06' 45"	66° 45'	231	29.95	30.50	29.50	1.00	29.95	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, W. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S.W. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, E. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26	93	.....	.....	.....	2.50	0.58	1.03	7.50	0	2		
Antigonish, S. Pt.	49° 02' 00"	66° 45'	30	30.00	30.55	29.55	1.00	30.00	78	1	1	3	2	3	0	0	13	37	130	26												

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
OCTOBER, 1902.

STATIONS.	RAINFALL.					SNOWFALL.					REMARKS.
	Amount	No. of	No. of	Heaviest	Date.	Amount	No. of	Heaviest	Date.		
	in inches.	Days or Over.	Fair Days.	Fall in Month		in inches.	Days.	Fall in Month			
BRITISH COLUMBIA	in.			in.		in.		in.			
Cootnam .....	5.06	10	21	1.41	29						
Caulfields .....	4.48	14	17	0.82	31					Fog 10, 11, 13, 14, 16, 18, 25.	
Goldstream Lake .....	3.29	13	18	1.36	30						
Royal Oak .....	2.15	10	21	0.45	27						
Kuper Island .....	2.96	13	18	0.71	31					Fog on 9, 21, 31; 1st snow on mountains.	
Nanaimo City .....	2.10	11	20	0.40	29						
Naas Harbour .....	6.34	14	17	1.80	16		1	*	29		
Port Essington .....	9.07	17	14	2.23	29					No snowfall.	
N. W. TERRITORIES—											
Innisfail .....	0.02	1	29	0.02	17		1	*	17		
Broomhill .....	0.65	2	29	0.59	21	0.5	1	0.5	21		
Brueberheim .....	0.65	4	26	0.32	11		1		19	Thunder 15, 17.	
Dirt Hills .....	0.00	0	31	0.00	0					Very smoky.	
Weyburn .....	0.16	1	30	0.16	12						
Whitewood .....	0.04	2	28	0.03	24		1	*	26		
Saltcoats .....	0.09	1	30	0.09	29						
MANITOBA—											
Norquay .....	0.53	2	27	0.36	25		1	*	13		
Beaver .....	0.57	4	27	0.46	25						
Cartwright .....	0.72	4	27	0.60	24					Snow 11.	
Gretna .....	1.03	3	27	0.78	25						
Dauphin .....	0.46	6	25	0.25	10						
Belmont .....	0.45	3	28	0.43	25					Fog 23.	
Oakdale Park .....	0.88	5	26	0.79	25	2.5	1	2.5	12		
ONTARIO—											
Ursal .....	4.41	15	16	0.83	5		2	*	29	Thunder 7, 8, 9, 19, 24.	
Dealtown .....	1.87	9	22	0.62	13					29, tender plants killed.	
Warton .....	4.47	14	16	1.49	12		1	*	28	Thunder 24, 26; fall flow ers still in bloom on 31.	
Dutton .....	1.86	5	24	0.62	10	0.5	1	0.5	29	Thunder 17, 21.	
Aurora .....	2.70	12	19	1.18	5					Thunder 5, 24.	
Croydon .....	1.30	6	24	2.22	1					10, ice lin.; thunder 25, 30.	
Deer Park .....	2.95	9	22	1.14	5						
Princeton .....	2.58	8	23	0.78	22					Thunder 18, 22, 24.	
Arden .....	4.28	16	15	1.20	1					17, ice lin.; thunder 30.	
Georgetown .....	3.22	14	15	1.05	13		1	*	29	Thunder 5, 7, 13, 18, 22, 26; Aurora 30, 31.	
Newburg .....	3.41	11	20	1.00	1					Thunder 24, 30.	
Westport .....	4.27	12	19	1.50	1					Fog 5, 6; thunder 24, 30.	
Westminster .....	2.96	8	22	0.97	12	2.0		2.0	28		
Uxbridge .....	3.07	10	21	1.03	5					Thunder 5.	
Sunshine .....	3.82	16	15	0.81	13	0.7	1	0.7	29	Thunder 22.	
Oliver's Ferry .....	2.02	10	21	0.51	19						
Watford .....	2.91	7	24	1.20	5						
Orangeville .....	3.17	15	14	0.92	13	0.3	1	0.3	29		
Port Barwell .....	1.52	8	23	0.43	26					Thunder 22, 26.	
Ennisdale .....	4.22	16	15	0.93	13	0.8	3	0.8	28	Thunder 24; Aurora 31.	
Montague .....	3.39	8	23	0.78	1					Thunder 30.	
Parma .....	4.51	10	21	2.22	1						
Midland .....	3.49	10	21	0.87	12		2		28	Thunder 24.	
Wooler .....	3.43	10	21	1.03	1					Thunder 5, 24, 30.	
Jermyn .....	3.35	9	22	0.71	5					Thunder 13, 18, 30.	
Goderich .....	2.92	8	23	0.56	22						
Scarboro' .....	2.78	10	20	1.35	5		1	*	29	Thunder 5, 12, 23; fog 18, 19.	
Cayuga .....	3.22	10	21	0.87	22						
Craigleith .....	1.13	10	21	1.16	25						
Emmimore .....	1.97	3	28	0.75	5						
Wyoming .....	2.15	8	22	0.75	7		1		29	Thunder 22, 26.	
Smith's Falls .....	3.98	11	19	1.32	1	0.5	1	0.5	28	11th, birds nearly all gone.	
Providence Bay .....	2.17	11	19	0.75	13	0.5	1	0.5	28	Thunder 24.	
Lion's Head .....	3.58	9	22	1.25	13					Thunder 24, 26.	
Lansdowne .....	2.14	1	27	1.07	1						
Nottawasaga .....	3.00	8	33	0.80	5					Thunder 24, 25, 26.	
Deer Park .....	2.98	9	22	1.14	5						
N. Williamsburg .....	2.43	7	24	1.03	9						
NEW BRUNSWICK											
Point Escommie .....	1.50	9	22	1.30	29					Thunder 19.	
NOVA SCOTIA—											
Port Morien .....	2.83	8	23	1.40	29						

*Thunder recorded on .—*

2. Bermuda.
4. Port Dover.
5. Port Stanley, Lindsay, London, Stony Creek, Brantford, Dunnville, Hamilton, Agincourt, Scarboro, Uxbridge, Georgetown, Aurora, Toronto.
6. Ottawa, Quebec, Father Point.
7. London, Stratford, North Bruce, Lucknow, Georgetown, Ursa, Father Point, Bermuda.
8. Pictou, Channel, Summerside, Haliburton, Ursa, Truro, Charlottetown.
10. Port Arthur.
12. Renfrew, Scarboro', Yarmouth.
13. Shawinigan Falls, Brome, North Bruce, Clontarf, Dunnville, Jermyn, Georgetown.
15. Bruederheim, Bon Accord.
17. Port Stanley, Bruederheim, Bon Accord, Birnam, Dutton.
18. Princeton, Toronto, Woodstock, London, Stratford, Savanne, Welland, Lucknow, Brantford, Dunnville, Paris, Hamilton, Port Dover, Agincourt, Scarboro', Jermyn, Westminster, Georgetown.
19. Quebec, Lindsay, Stratford, Brome, N. Bruce, Clontarf, Welland, Sutton West, Stony Creek, Brantford, Paris, Hamilton, Port Dover, Point Escuminac, Ursa, Yarmouth, Father Point.
20. Fredericton, St. Agathe, Renfrew, Perce, Richmond, Summerside, Moncton, Arden, Truro, Yarmouth.
21. Jermyn, Dutton.
22. Stratford, Birnam, N. Bruce, Welland, Belleville, Stony Creek, Brantford, Dunnville, Paris, Hamilton, Port Dover, Wyoming, Port Burwell, Westminster, Georgetown, Princeton.
23. Port Stanley, Scarboro', Sunshine.
24. Parry Sound, Montreal, Gravenhurst, Guelph, Lindsay, Stratford, Brome, Beatrice, Uplands, N. Bruce, Bala, Clontarf, Lucknow, Sutton, West Belleville, Vankleek Hill, Owen Sound, Lakefield, Westport, Peterboro', Erasmus, Brantford, Meaford, Hamilton, Agincourt, Haliburton, Nottawasaga, Lion's Head, Providence Bay, Wooler, Midland, Enniskillen, Westport, Newburgh, Princeton, Aurora, Warton, Ursa, Toronto, Haileybury.
25. Woodstock, Ridgetown, Rocklyn, Nottawasaga, Arden.
26. Port Stanley, Parry Sound, Guelph, London, Stratford, Beatrice, Birnam, Uplands, N. Bruce, Bala, Collingwood, Sarnia, Lucknow, Sutton West, Rocklyn, Erasmus, Orillia, Hamilton, Port Dover, Nottawasaga, Lion's Head, Providence Bay, Wyoming, Port Burwell, Westminster, Georgetown, Warton, White River.
28. Port Bobs.
30. Wooler, Montague, Westport, Newburgh, Georgetown, Arden, Croydon, Point Lepreaux, Deseronto, Lindsay, Chilliwack, Renfrew, Alberni, N. Nicomen, N. Bruce, Sutton West, Peterboro, Otonabee, Port Hope, Agincourt, Jermyn, Lakefield, Grand Manan, Yarmouth.

*Aurora recorded .—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

1. Aweme, IV.
3. Pembina Crossing, I; Bowsman, IV.
4. Haileybury, IV; Savanne.
6. Bowsman, IV.
23. Father Point, III.
27. Bowsman, IV; Truro, IV.
28. Gravenhurst, I.
29. Pembina Crossing, III; Aweme, IV; Bowsman, IV; Treherne, Haileybury, IV.
30. Pembina Crossing, II; Knee Hill, Aweme, II; Bowsman, IV; Georgetown, IV; Truro, IV.
31. Gravenhurst, IV; Georgetown, IV; Haileybury, IV.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF OCTOBER, 1902.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria	0.00	0.16	0.35	0.38	0.42	0.45	0.48	0.48	0.51	0.45	0.32	0.04				
Nanaimo	0.01	0.23	0.39	0.41	0.44	0.45	0.48	0.50	0.50	0.53	0.40	0.06				
Agassiz	0.00	0.07	0.34	0.42	0.40	0.47	0.52	0.50	0.47	0.47	0.13	0.01				
Battleford	0.04	0.21	0.55	0.57	0.63	0.67	0.59	0.60	0.61	0.59	0.48	0.20	0.00			
Indian Head	0.00	0.00	0.23	0.46	0.52	0.63	0.67	0.68	0.64	0.41	0.10	0.01				
Brandon	0.05	0.23	0.44	0.50	0.50	0.55	0.55	0.56	0.52	0.32	0.06	0.00				
Winnipeg	0.00	0.07	0.37	0.48	0.51	0.52	0.47	0.49	0.39	0.40	0.36	0.01				
Woodstock	0.00	0.14	0.31	0.41	0.45	0.46	0.45	0.43	0.39	0.37	0.18	0.00				
Toronto	0.00	0.14	0.31	0.39	0.46	0.49	0.47	0.46	0.59	0.59	0.36	0.04				
Lindsay	0.04	0.16	0.25	0.33	0.44	0.45	0.48	0.54	0.45	0.33	0.28	0.09				
Gravenhurst	8	0.17	0.39	0.45	0.48	0.45	0.49	0.50	0.55	0.51	0.39	0.03				
Barrie																
Kingston	0.06	0.29	0.39	0.39	0.43	0.42	0.44	0.38	0.31	0.31	0.15	0.01				
Ottawa	0.00	0.16	0.34	0.39	0.37	0.34	0.40	0.36	0.37	0.31	0.15	0.00				
Montreal	0.04	0.20	0.35	0.43	0.38	0.51	0.46	0.41	0.32	0.21	0.05	0.00				
Quebec	0.00	0.01	0.22	0.33	0.46	0.38	0.33	0.34	0.27	0.16	0.01	0.00				
Fredericton	0.02	0.29	0.42	0.51	0.55	0.63	0.70	0.68	0.68	0.55	0.35	0.03				

	Victoria	Nanaimo	Agassiz	Battleford	Indian Head	Brandon	Winnipeg	Woodstock	Toronto	Lindsay	Gravenhurst	Barrie	Kingston	Ottawa	Montreal	Quebec	Fredericton
Mean proportion for month (Constant sunshine being 1)	0.37	0.42	0.35	0.53	0.40	0.39	0.37	0.33	0.39	0.35	0.40		0.31	0.29	0.39	0.23	0.49
Difference from average	0.01	—	0.06	0.15	0.04	0.02	0.00	0.07	0.05	0.05			0.40	0.08	0.03		0.05
Maximum daily amount	0.89	0.90	0.82	0.99	0.78	0.90	0.82	0.87	0.90	1.00	0.90		0.92	0.86	0.95	0.74	0.92
Date	23	6	23	3	21	3	20	31	9	10	10		21	23	10	23	4
No. of days completely clouded	7	7	13	14	7	6	11	14	7	8	5		8	7	6	11	3

## FORECASTS FOR OCTOBER, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1,124. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	84	68	14	2	80.9
Lake Superior.....	109	77	25	7	82.1
Lower Lake Region.....	123	106	9	8	89.8
Georgian Bay.....	123	105	12	6	90.2
Ottawa Valley.....	119	91	11	17	81.1
Upper St. Lawrence.....	121	109	12	9	87.6
Lower St. Lawrence.....	113	85	17	11	82.7
Gulf.....	112	76	19	17	76.3
Maritime Provinces, West.....	109	84	14	11	83.5
Maritime Provinces, East.....	111	92	9	10	86.9
Total.....	1,124	884	142	98	85.0

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

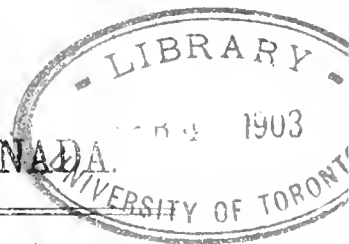
In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,

*Director.*

Meteorological Office, Toronto,  
26th November, 1902.





# Monthly Weather Review.

VOL. XXVI

NOVEMBER, 1902.

No. 11

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## REMARKS UPON THE WEATHER.

In Vancouver Island and other islands of British Columbia the weather conditions did not depart much from the normal, but in most districts periods of fine dry weather were somewhat more frequent than usual. From the 18th to 25th there was much bright sunshine and in more northern localities fine weather was recorded from the 2nd to 7th. High winds occurred frequently and light frosts were also frequent. Over the Lower Mainland there was much dull stormy weather with frequent rains, the only distinctly fine weather occurring about the 3rd to 5th and 19th to 22nd. Frosts occurred on about seven days, but they were mostly light. Over the Upper Mainland clouded skies with snow or rain were the prevalent conditions during the first half of the month, after which, the precipitation was generally less frequent and some bright days were recorded. Frosts occurred almost daily, and the temperature fell below zero at Golden on the 27th and 28th.

In the North-west Territories the chief feature of the weather was the rise in temperature after the 15th, the second half of the month being milder than the first half. From the 6th to the 12th unusually cold weather prevailed, temperatures between  $-15^{\circ}$  and  $-26^{\circ}$  being recorded at some places. The precipitation which was chiefly snow and was somewhat excessive in northern districts, was more prevalent during the first half of the month. In the southern portion it was generally light and although bright sunshine was deficient there was much fine weather after the 15th throughout the Territories.

In Manitoba although the weather was excessively cold from the 8th to 11th, also after the 23rd, somewhat higher mean temperature than usual was general. Throughout the month there was much cloudy weather, and in some localities the precipitation was excessive, whilst in others it was deficient. On or about the 8th, when there was a decided drop in the temperature, the ground was frozen, rivers were closed and wintry conditions had fairly set in.

The weather throughout Ontario was exceedingly mild and dry, the maximum temperature generally exceeding  $50^{\circ}$  each day in southern counties and being correspondingly high in northern districts. On or about the 23rd there was a marked drop in the temperature, a fall of snow occurred in many places two or three days later, and much more winterlike conditions prevailed after that date. In the western and eastern portions of the Province there was somewhat more bright sunshine than usual, but in the vicinity of Toronto it was normal or slightly below. Many plants were in bloom and migratory birds were seen up to an unusually late date nevertheless sleighing was possible in Toronto and many other places on or about the 27th, and small streams were frozen by the 30th.

In the Province of Quebec the weather conditions were similar to conditions in Ontario, but the departures in the mean temperature were not generally quite so high. After the 25th low temperatures prevailed for four or five days, and some snow falling on the 27th winter had practically set in. Owing to a rise in temperature on the 30th much of the snow disappeared and in the City of Quebec the depth late in the day did not exceed one inch.

The weather in New Brunswick was unusually mild and exceedingly dry, the precipitation being quite light in most places. In most districts the sky was overcast very frequently, the only distinctly bright weather occurring about the 7th to 11th, also on the 26th and 30th. Light winds generally prevailed, but gales were reported on the 22nd, 24th, 28th and 29th. Although there was a change to somewhat cold weather on the

8th the range of temperature during the month was comparatively small. Although ice formed on the rivers in some places they were all open on the 30th, when there was little frost in the ground.

In Nova Scotia mild and very dry weather also prevailed but in northern districts the departures from the normal were generally unimportant. Throughout the month there was much bright weather in most districts, whilst in the vicinity of Parrsboro' clouded skies were almost continuous. Four gales passed over the Province but comparatively little damage was caused thereby. On the 30th all rivers were open and the ground was not frozen.

In Prince Edward Island the weather condition were similar to conditions in New Brunswick mild dry weather prevailing. After the 8th lower temperatures were recorded, frosts at night were frequent and on the 12th snow was general; but on the 30th although there was about half an inch of snow on the ground in some places there were no other signs of winter.—F. F. PAYNE.

#### ATMOSPHERIC PRESSURE.

The mean pressure ranged from 30.07 in Nova Scotia, to 29.83 in Alberta. The greatest deficiency, 0.15 of an inch, occurred at Calgary, Alta, and the chief excess, 0.08 of an inch, at Sydney, C.B. Pressure was below average from British Columbia to Ontario, and average or above in Quebec and the Maritime Provinces.

#### HIGH AREAS.

Eleven areas of high pressure were of sufficient importance to be traced. Four passed from the Middle Pacific States well to the southward and off the Atlantic Coast and two of the areas which first appeared in the North-west Territories also travelled to the southward; giving a gradient during the month largely for south-west and south winds the probable cause of the phenomenally mild weather which generally prevailed over a great portion of Canada.

No. 1 was situated in the west Pacific States on the 1st; between the 2nd and 3rd, its centre passed from Colorado to Tennessee thence northeastward off the Middle Atlantic coast and to the southward of Nova Scotia. An effect of the movement was to draw southwesterly and southerly winds over Canada between the Lakes and the Maritime Provinces attended by mild weather. No. 2 travelled from Alberta to Iowa between the 3rd and 6th, thence directly over the Lower Lake Region, the Upper St. Lawrence and the Maritime Provinces. Fine weather accompanied this area during its passage over the different districts. No. 3 travelled from the North-west Territories to the Ottawa Valley between the 7th and 11th, and then drew southward, finally breaking up on the 13th over the South Atlantic States. It was accompanied by very low temperatures in the Territories and Manitoba and by sharp freezing weather of short duration in Ontario, Quebec and the Maritime Provinces. No. 4 was an area of feeble energy which passed quickly from Saskatchewan to the Gulf of St. Lawrence between the 11th and 13th. No. 5 was centred during the early part of the 13th in southern Dakota, having seemingly passed rapidly in from the Middle Pacific Coast. Its course was afterwards over Lake Superior and to the northward of the Ottawa Valley. No. 6, a more pronounced area than its two predecessors passed southward from the North-west Territories to Texas between the 14th and 17th, thence slowly north-eastward to the State of New York, when it drew southward again and finally passed off the South Atlantic Coast on the 22nd. While its influence lasted in the eastern part of the continent, fine mild weather generally prevailed from Ontario to the Maritime Provinces. No. 7, which was probably an off shoot of No. 6, traversed the Ottawa and St. Lawrence Valleys and the Maritime Provinces between the 16th and 19th. No. 8 was situated in the vicinity of Oregon, between the 20th and 21st, and travelled south-eastward across the Continent, passing off the south Atlantic Coast on the 24th. No. 9 moved from the California Coast into Oregon between the 24th and 25th, thence south-eastward into Texas and finally on the 29th it passed off the Middle Atlantic Coast. No. 10 was a very moderate area which travelled between the 24th and 26th from Manitoba to the Lower St. Lawrence Valley and the Gulf. No. 11 appeared on the Middle Pacific Coast on the 27th and by the night of the 30th, it had reached the Ohio Valley.

#### LOW AREAS.

Sixteen areas of low pressure were sufficiently well defined to be charted, being a larger number than usually occur in November. Seven travelled from the north westward, four from the westward, four from the south-westward and one up the Atlantic Coast. No. 1 was situated in Colorado on the morning of the 1st as a very moderate depression. Its course was then (between the 2nd and 3rd) to the Upper Lake Region and down the St. Lawrence Valley; drawing fresh to strong, southerly to westerly winds over Ontario and Quebec attended by showers, the rain being more general and heavier in the Lake Superior district than elsewhere. No. 2 was first in evidence on the 2nd on the northern coasts of British Columbia. It was another area of moderate energy, and after reaching the Lake Superior district on the 4th, it dispersed. It was accompanied over its course by fresh to strong winds and light precipitation, the latter being mostly as snow in the Terri-

tories and Manitoba. No. 3 travelled from Texas to Michigan between the 3rd and 5th, and thence over the Lower Lake Region and the St. Lawrence Valley to the Gulf of St. Lawrence, bringing a general and fairly heavy rainfall in Ontario and Quebec and the Maritime Provinces, together with moderate gales in the Lake Region and the northern part of the Gulf of St. Lawrence. No. 4 appeared over the Straits of Juan de Fuca, on the 6th, thence moved near the International Boundary into the North-west Territories and Manitoba and subsequently between the 8th and 10th, far north of the Lake Region into the Gulf of St. Lawrence. It gave stormy conditions from the Pacific Coast to Manitoba, snow occurring generally in the North-west, and snow and rain in British Columbia; ultimately it was largely responsible for the moderate local gales which were experienced on the 10th in the Gulf of St. Lawrence. No. 5 passed up the Atlantic some distance off the United States seaboard from Florida to Newfoundland between the 5th and 11th. Its only effect on Canadian weather was to cause a little rain, which was not general, in the Maritime Provinces. No. 6 travelled with great rapidity between the 11th and 12th, from Wyoming, over the Lake Region and across the Ottawa Valley to the Nova Scotian Coast. It was an area of a good deal of energy, accompanied by rain in Ontario and snow and rain in Quebec and the Maritime Provinces as well as by moderate southerly to westerly gales in the Lake Region. No. 7 was situated in Colorado on the 12th, and progressing north-eastward, it reached the Gulf of St. Lawrence on the 14th. During its presence cold wintry weather prevailed in the Province of Quebec attended by a considerable snowfall, while over the greater portion of Ontario the conditions were spring like, with daily maxima above 60. In the Maritime Provinces the weather meanwhile was unsettled with sleet and rain. No. 8 moved from Texas to the Straits of Mackinaw between the 13th and 14th, thence into the Ottawa and St. Lawrence Valleys, reaching the Gulf of St. Lawrence on the 16th. It was a depression of moderate energy and during its passage over Canada was accompanied by a few showers only, except in the Lake Superior district where rain and snow were more or less heavy. No. 9 travelled between the 15th and 18th, from the north British Columbia Coast into northern Alberta and Saskatchewan and then out of the range of observation, bringing a marked change to milder weather in the Territories and Manitoba. No. 10 was first defined in New Mexico and Texas on the 15th and 16th, and after arriving in the Alleghany Valley it divided into two parts, one moving to Lake Erie and breaking up, the other to the Carolina Coast and out to sea. It gave a moderate rainfall in Ontario and Quebec and a few showers in the Maritime Provinces. No. 11 appeared over northern Alberta on the 20th, and arrived to the northward of Lake Superior on the morning of the 21st. Up to this time it had not shown any marked activity, but it now travelled southward into the Ottawa Valley with increasing intensity, and reached the Lower St. Lawrence and the Gulf as a storm of marked energy. In the Territories and Manitoba it did not materially affect the weather then prevailing there, but from Lake Superior to our Atlantic Coast it occasioned moderate to fresh gales generally, together with a few showers in Ontario and a more general rain in Quebec and the Maritime Provinces. No. 12 followed very much the same course as its predecessor, but it was not so energetic. It appeared in Northern Alberta on the 24th and arrived in the Lower St. Lawrence Valley and the Gulf on the 24th, and caused a moderate gale from Lake Superior to the Maritime Provinces as well as high winds in the Territories and Manitoba. No. 13 appeared in Northern Alberta on the 24th, and dispersed over Manitoba on the 25th, accompanied over its course by a moderate but general snowfall. No. 14 was situated over the State of Mississippi during the early part of the 25th, having apparently originally moved from the neighbourhood of Texas. It travelled slowly to Lake Ontario, thence to the New England States and across New Brunswick, acquiring great energy as it passed again into Canadian Territory. It caused a north-east gale over the Lake Region, with rain turning to snow and a heavy gale throughout eastern Canada, with a considerable snowfall in Quebec, and with rain and snow in the Maritime Provinces. No. 15 moved into Northern Alberta on the 26th, and reached the Lake Superior district on the 29th, where it became united with a subsidiary depression which had meanwhile formed in Kansas, and passed north-eastward over Lake Michigan. The system then travelled far to the north towards Labrador. In the Territories and Manitoba it brought high winds and snow, the fall being heavy in Saskatchewan. In the Lake Region it caused a south and west gale which in many localities was the heaviest storm of the month. The gale was also general in the Ottawa and St. Lawrence Valleys, but it only extended locally to the Gulf of St. Lawrence, at the same time there were light falls of rain, sleet and snow in Ontario, Quebec and the Maritime Provinces. No. 16 was situated in British Columbia on the 28th, and by the evening of the 30th it had reached Manitoba attended over its course by light local snowfalls.

#### WINDS.

In Vancouver Island and the Lower Mainland of British Columbia the south and east was more general than any other direction but by no means paramount. There were six days with strong and fourteen with fresh breezes and on four occasions the force of a gale was experienced.

In the North-west Territories the south and west directions were more generally experienced than any others. There were twelve days of strong and ten days of fresh breezes and three gales.

In Manitoba the direction was largely southerly to westerly. There were eight days of strong and fourteen of fresh breezes and three gales.

In the Lake Region the direction was largely southerly to westerly. There were eight days of strong and eleven days of fresh breezes and seven gales, the latter occurring on the 6th, 12th, 14th, 22nd, 24th, 26th and 29th.

In the Ottawa Valley and Upper St. Lawrence the direction was chiefly southerly to westerly. There were five days of strong and ten days of fresh breezes and six gales.

In the Lower St. Lawrence Valley and the Gulf the direction was mainly southerly to westerly. There were six days of strong and eleven days of fresh breezes and five gales, the latter occurring on the 6th, 10th, 24th, 28th and 30th.

In the Maritime Provinces the direction was chiefly southerly to westerly. There were six days of strong and nine of fresh breezes and three gales, the latter on the 22nd, the 24th and between the 26th and 28th.

In the Lake Region the heaviest storms of the month were those occurring on the 22nd and 29th, and the heaviest storm in the Gulf of St. Lawrence and in the Maritime Provinces was on the 28th. The gales occurring in the Lake Region were all warned except that of the 14th. On this occasion Lake Superior only was warned: the gale, however, was quite moderate and not general. The warning issued for the gale of the 23rd was late, except on Lake Superior, this was largely owing to delay in transmission. Fort William and Port Arthur were not warned for the gale of the 22nd, but it seems doubtful if the storm was experienced to any extent over the western half of the lake, although severe near Sault Ste. Marie. The gales in the Gulf of St. Lawrence and in the Maritime Provinces were all successfully warned except the moderate local storm occurring at ocean ports on the 24th.

During the latter part of the month sixty-five lives were lost on the Lakes alone by the destruction of five vessels, the *Lockwood*, *Bannockburn*, *Macy*, *Celtic* and *Charles Hebard*. If more mariners could be induced to keep in touch with the weather bureaus and heed more the display of storm warnings there can be but little doubt that at least some of these many and frequently occurring appalling catastrophes would be avoided.

#### BRIGHT SUNSHINE.

Bright sunshine was less than the average amount over the Dominion except at Victoria, B.C., and in the larger portion of Ontario. The excess nowhere exceeded six per cent, and the deficiencies were also small except in parts of Manitoba where they were rather marked. The percentage of possible duration ranged from 33 at Kingston, Ont., to 10 at Agassiz, B.C.

#### TEMPERATURE.

A phenominally high mean temperature prevailed over the region of the Great Lakes and thence westward to Manitoba and eastward in the St. Lawrence Valley to below Montreal, a positive departure of 7° being recorded in many localities, including Toronto, where continuous observations since 1830 show that the month just closed was the mildest November on record. Westward from Winnipeg the positive departure diminished to just normal at Swift Current, while over the greater part of Alberta and Northern British Columbia there was a negative departure of 3° or more. In southern British Columbia the departure was from 0 to 3° below average. The more easterly portions of Quebec and the whole of the Maritime Provinces showed a positive departure from average of from 2° to 3°.

*The Highest and Lowest temperatures in each Province during November, 1902, were:*

British Columbia,	65.5 on 2nd at Clayoquot.	— 7.0 on 7th at Quesnelle.
North-west Territories,	67.0 on 2nd at Alameda.	—26.8 on 10th at Athabasca Landing.
Manitoba,	65.0 on 2nd at Treherne.	—17.0 on 10th at Bowsman.
Ontario,	75.0 on 2nd at Cottam.	—14.0 on 25th at Savanne.
Quebec,	66.0 on 6th at Richmond.	1.4 on 30th at Chicoutimi.
Nova Scotia,	62.0 on 10th at Halifax.	16.8 on 30th at Truro.
New Brunswick,	63.0 on 5th at Chatham.	12.0 on 29th at Dalhousie.
Prince Edward Island,	59.0 on 5th at Hamilton.	20.3 on 26th at Summerside.

#### PRECIPITATION AND DEPTH OF SNOW.

The precipitation was apparently very nearly average in British Columbia, and at low levels it was almost entirely rain. In the North-west Territories and Manitoba, where it was chiefly in the form of light snowfalls, it was also nearly average; in some localities slightly in excess, and in others, to a small extent deficient. From Lake Superior eastward to the Maritime Provinces there was a very general and marked deficiency, in many districts

not more than half the average amount being recorded. Until the last week, in Ontario and Quebec, the precipitation was almost altogether rain, but during the last few days snow fell to the depth of several inches in nearly all localities.

At the close of the month the mountains and northern portions of British Columbia were snow-covered to a considerable depth; nearly all the prairies of the North-west Territories and Manitoba had a light covering, and in parts of Saskatchewan the snow was reported to be deep. In New Ontario the depth was from two to six inches, and in the northern and eastern parts of the province there was a light covering, while in the more southern and south-western portions there were only patches here and there.

In Quebec the depth ranged from two or three inches in western districts to about ten inches in the eastern portion of the province, while over nearly the whole of the Maritime Provinces the ground was bare.

#### NOVEMBER GALES FROM THE GREAT LAKES TO THE MARITIME PROVINCES.

In the January Monthly Weather Review for the current year, a paper was published treating of the gales which have occurred in Canada from the Great Lakes to the Maritime Provinces in the month of January from 1874 to 1902 inclusive. Some interest in this paper having been shewn, a similar review for November, 1873 to 1902, has been attempted, hoping that it will prove as instructive to other weather forecasters as it has to the writer.

The table of the number of low areas charted, the percentage of storms caused by them and the percentage of storms caused by lows from the several directions is as follows:—

NUMBER OF LOWS AND THE DIRECTION FROM WHICH THEY CAME.

Total Number.	North-west.	West.	South-west.	Atlantic.	Erratic.
347	168	59	83	31	6

TOTAL PERCENTAGE OF AREAS CAUSING GALES, ALSO PERCENTAGE OF GALES FROM AREAS FROM THE SEVERAL DIRECTIONS.

District.	Total Number of Gales.	Percentage.	Percentage from North-west.	Percentage from West.	Percentage from South-west.	Percentage from Atlantic.
Lakes.....	188	54.2	49.4	69.5	67.5	0.7
Lower St. Lawrence and Gulf.....	152	43.8	31.0	45.8	60.2	50.7
Maritime Provinces.....	142	40.9	25.0	40.7	59.0	70.0

For explanation, it is stated that "North-west Lows" are those originating or moving from the British Columbia Coast and east as far as Manitoba. "West Lows" those from the Pacific Coast States and West States between latitudes 48° and 35°. "South-west Lows" from Lower California, Mexico, Texas and the Gulf of Mexico. "Atlantic Lows" as designated. "Erratic Lows" developing anywhere from the Lakes east to the Maritime Provinces, including the New England States.

The lows comprise all those occurring which were sufficiently well defined to be traced on the charts.

In November the number of storms caused by erratic lows is very few in number, even less than in the January series.

The diminution of storms attributable to north-west lows in their eastward advance is also more marked than in January. The number of storms caused by west lows decreases as they progress eastwards even more rapidly than does the number caused by north-west lows, this is somewhat opposed to the January conditions. The percentage of storms caused by south-west lows is considerably larger in November in the Lake Region than it is either in the lower St. Lawrence Valley and the Gulf or in the Maritime Provinces. This is contrary to what occurs in January and proves pretty conclusively that the south-west low has a tendency to travel more inland in the Autumn months than later in the winter. This is certainly instructive. The general characteristics of the Atlantic lows vary very little from those of January except that their number appears to be slightly greater and on rare occasions they spread sufficiently far inland to cause a storm on the Lakes.

November is generally asserted to be the stormiest month of the year in the Lake Region. It is undoubtedly on the average the stormiest month during the season of navigation, the number of very heavy gales that occur is not however very large although greater than in December, and whereas some Novembers may be excessively stormy others are comparatively free from storms.

In the Lower St. Lawrence Valley and the Gulf, also in the the Maritime Provinces November is not as stormy a month as the three succeeding it.

The gales of November have been divided into three classes, those of a very heavy type, the fresh gales and the moderate storms. Adding the first two classes together the percentage of the fresh to very heavy gales for the districts is as follows: Lower Lakes 43.1 per cent, Lower St. Lawrence and Gulf 61.8 per cent. Maritime Provinces 49.3 per cent. Consequently fresh to heavy gales are more numerous in the Lower St. Lawrence Valley and the Gulf than in the Maritime Provinces and much more so than on the Lakes. In the Lake Region the gales of a marked heavy type were 43, this number being considerably greater than in the January series. In the Lower St. Lawrence Valley and the Gulf the number was 49, which is 19 less than in January, and in the Maritime Provinces 34, being 20 less than in January. As before mentioned the November series embraces one year more than that for January.

The south-west low is responsible for the greatest number of heavy gales and the north-west low comes the next with about half the number.

No apparent hard and fast rules can be laid down for the development of any gale from the most severe to the most moderate but there is unquestionably a tendency for types of conditions to be repeated and for a series of storms either to develop in much the same locality or else to move from much the same quarter, their general conditions and accompaniments being very similar; this at times is particularly marked.

The low area with two foci and the low area with the extensive trough, in which the subsidiary development so often occurs, in its southern quadrant, are two classes of depressions responsible for some of the heaviest storms.—B. C. WEBBER.



## PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, NOVEMBER, 1902.

Barometer not reduced to Sea Level. \* Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above Sea Level in feet.	PRESSURE.		TEMPERATURE.			DIRECTION OF WIND FROM										VELOCITY OF WIND		PRECIPITATION.		No. of Thunder storms.	No. of fair days.	Days with 1/4 or more.							
				Mean reduced.	Range.	Mean.	Difference from average.	Highest.	Lowest.	Date.	Mean daily range.	Mean amount of cloud.	No. of days completely clouded.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	C.				Total number of hours.	Mean miles per hour.	Highest days velocity.	Date and direction from.	Amount.	Difference from Average.	Heaviest fall in month.
N. W. THERMISTERS:—Cont.																																
Cannington Manor.....	49 43 10	2	2 64	29 34 57	29 43 14	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Macleod.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Gateshead.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Puncher Creek.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Grenfell.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Kneehill.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Muskowong.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Fort Simpson.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Alameda.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Gray Hill.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Saskatoon.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Craze Lake.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Moosomin.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Athabasca Landing.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Calgary (Exp. Station).....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Crescent Lake.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Estevan.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Melfort.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Lethbridge.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Duck Lake.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Albany.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Edmonton.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Bon Accord.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
High River.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Wetaskiwin.....	49 44 13	24	187 9	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
MANITOBA:																																
Winnipeg.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
St. Albans (Aweme).....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Port Osborne.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Brandon.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Channel Island.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Elkhorn.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Stony Mountain.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Stony Mountain.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Treherne.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Hillview.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Almasippi.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Pinestone.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Bowman.....	49 52 37	7	700	29 30 50	29 45 11	22 6	4 4 15 52 0	1 12 7	30 17 0	1 12 7	30 17 0	6	8	3	3	4	1	1	8	8	7	25	60	17 1	29 W	0 81	0 16	0 30	10 20	1	0	0
Oakbank.....	49 52 3																															







PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
NOVEMBER, 1902.

STATIONS.	RAINFALL.					SNOWFALL.					REMARKS.
	Amount in inches.	No. of Days of or Over.	No. of Fair Days, in Month	Heaviest Fall in Month	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month	Date.		
	in.			in.		in.		in.			
BRITISH COLUMBIA—											
Nanaimo.....	7.52	16	14	1.70	1	3.0	1	3.0	6		
Cooquitlan.....	12.88	21	9	2.41	29-30	—	1	—	6		
Caulfields.....	10.53	25	5	1.07	16	—	—	—	—		Snow on 6.
Goldstream Lake.....	12.35	29	1	3.03	30	11.0	2	7.0	8		
Kuper Island.....	7.88	25	5	1.58	30	7.4	2	4.2	6		
Royal Oak.....	8.86	20	10	1.70	30	—	1	—	6		Thunder on 6.
Naas Harbour.....	7.19	14	16	2.00	25	8.0	6	2.0	29		
Port Essington.....	26.68	24	6	9.67	26	8.9	4	8.0	28		
N. W. TERRITORIES—											
Broomhill.....	—	—	21	—	—	11.0	9	6.0	30		
Innisfail.....	—	—	21	—	—	8.8	9	3.0	7		
Weyburn.....	—	—	23	—	—	4.8	7	3.0	3		
Bruderheim.....	—	—	21	—	—	10.5	6	6.0	27		
Salteoats.....	—	—	21	—	—	11.0	6	3.0	14		
Stirling.....	—	—	23	—	—	10.0	7	4.0	29-30		
Whitewood.....	—	—	26	—	—	4.8	4	3.0	14		
Regina.....	—	—	22	—	—	1.6	8	0.8	15		
Victoria.....	—	—	26	—	—	8.5	4	5.5	11-12		
Willow Branch.....	—	—	23	—	—	4.4	7	2.0	9		
Beaver Hills E.....	—	—	21	—	—	9.3	9	3.3	27		
MANITOBA—											
Norquay.....	—	—	23	—	—	11.8	7	4.0	15		
Cartwright.....	0.19	3	24	0.16	3	4.5	3	2.0	14		
Morden.....	R	—	24	R	23	12.5	5	5.0	25		
Dauphin.....	—	—	23	—	—	8.7	7	4.0	25		
Rapid City.....	—	—	27	—	—	6.0	3	3.0	15		
Belmont.....	0.16	—	26	—	—	—	3	—	—		
Gretna.....	0.09	2	20	0.09	3	12.0	8	4.0	8		
Deloraine.....	—	—	24	—	—	8.0	6	2.5	4		
ONTARIO—											
Croydon.....	1.37	4	26	0.60	13	2.0	1	2.0	26		
Orangeville.....	1.70	12	16	0.75	12	3.8	2	3.0	23		Fog 14, 16, 17, 18.
Scarboro'.....	1.05	7	18	0.34	5	5.5	2	4.0	26		Fog 14, 15, 18, 19, 26.
Huntsville.....	1.67	6	22	0.94	12	5.0	2	3.0	26		
Deer Park.....	0.96	4	24	0.56	12	5.0	2	5.0	28		
Lion's Head.....	2.78	8	22	0.47	11	—	—	—	—		
Sunshine.....	1.67	12	17	0.59	12	3.5	1	3.5	27		
Warton.....	2.52	12	17	0.96	5	2.0	1	2.0	26		
Princeton.....	1.45	6	22	0.61	10-11	6.0	2	6.0	26-27		
Ursa.....	2.20	13	16	0.63	12	5.0	1	5.0	27		
Dealtown.....	1.85	7	21	0.66	25	1.5	2	1.5	25-26		
Cayuga.....	1.13	6	16	0.44	17	4.0	4	4.0	27-28		
Go Jorich, L. H.....	1.45	7	21	0.50	5	4.5	2	4.0	26		
Providence Bay.....	3.58	11	18	0.90	4	1.5	2	1.0	30		
Ennisville.....	0.82	3	26	0.38	10	—	1	—	26		
Georgetown.....	1.24	14	14	0.23	6	7.5	2	5.5	26		Aurora 23, 24; fog, 4, 5, 13, 14, 15, 18, 19, 20, Fog 13.
Uxbridge.....	1.26	8	19	0.48	11	6.5	1	5.0	26		
Westport.....	2.10	9	19	0.36	13	3.8	2	2.3	26		
Port Burwell.....	1.20	8	22	0.47	17	2.0	1	2.0	28		
Aurora.....	1.03	7	21	0.56	13-14	6.5	2	6.5	26-27		
Arden.....	1.56	15	14	0.34	11	3.0	1	3.0	27		
Newburgh.....	1.51	9	18	0.38	6	4.0	3	3.5	27		
Parma.....	1.14	5	25	0.37	12	—	—	—	—		
Lansdowne.....	1.24	4	25	0.34	13	1.0	1	1.0	26		
Jernyn.....	1.50	4	25	0.59	12	4.0	1	4.0	27		
Nottawasaga.....	0.30	3	26	0.10	13	6.0	2	6.0	27		
Wyoming.....	1.35	5	23	0.45	17	5.0	2	3.0	27		
Midland.....	1.74	13	16	0.43	11	7.0	3	7.0	26		
Montague.....	1.65	4	25	0.70	13	2.0	1	2.0	26		
Wooler.....	1.59	5	23	0.68	12	5.0	2	5.0	26-27		
Enisdale.....	2.72	12	13	0.75	12	7.5	6	4.0	26		
Oliver's Ferry.....	1.08	1	26	0.50	26	—	—	—	—		
Westminster.....	1.24	7	22	0.33	5	3.0	1	3.0	26		
Watford.....	0.88	5	—	0.40	16	—	—	—	—		
Craigboth.....	1.65	11	18	0.44	11	6.0	1	6.0	26		
Dutton.....	1.38	5	22	0.48	29	2.5	2	2.0	27		
NEW BRUNSWICK—											
Poinc Eschmire.....	0.79	4	22	0.36	27	9.4	4	4.2	12		Fog 6, 26.
NOVA SCOTIA—											
Port Morien.....	3.00	9	19	1.10	26	2.0	2	2.0	11-12		

*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

1. Bowsman IV.

9. Chicoutimi.

22. Grand Manan.

23. Grenfell, Melfort, Estevan, Moose Jaw, Lucknow, Savanne, Brandon, Bowsman, II : Athabasca Landing, III : Parrsborro, Georgetown, III : Pembina Crossing, II : Qu'Appelle : Swift Current, IV : Minnedosa, II : Quebec, IV : Picton, IV : Gravenhurst, III : Aweme, I : Cartwright.

24. Savanne, Georgetown, IV : Battleford, II.

25. Bowsman, IV : Port Arthur, III : Cape Magdalen.

29. Chicoutimi.

*Thunder recorded on :—*

6. Clayoquot, Royal Oak.

11. Hamilton, Guelph.

14. Meaford.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF NOVEMBER, 1902.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria .....				0 01	0 10	0 25	0 31	0 35	0 25	0 23	0 25	0 13	0 07			
Nanaimo.....				0 01	0 17	0 19	0 16	0 18	0 18	0 20	0 20	0 13	5			
Agassiz.....				0 07	0 08	0 11	0 17	0 13	0 13	0 08	0 11	0 08	0 00			
Battleford.....			0 03	0 14	0 22	0 31	0 32	0 33	0 36	0 35	0 32	0 07	0 00			
Indian Head.....				0 01	0 04	0 17	0 28	0 25	0 19	0 21	0 35	0 16	0 00			
Brandon.....				0 04	0 23	0 39	0 41	0 43	0 41	0 40	0 23	0 01	0 00			
Winnipeg.....				0 02	0 20	0 23	0 19	0 16	0 14	0 17	0 17	0 07	0 00			
Woodstock .....				0 02	0 17	0 28	0 36	0 35	0 43	0 44	0 43	0 36	0 10			
Toronto .....				0 00	0 18	0 34	0 34	0 31	0 28	0 32	0 32	0 30	0 06			
Lindsay.....				0 05	0 12	0 18	0 26	0 36	0 35	0 31	0 34	0 26	0 14			
Barrie .....																
Gravenhurst .....				0 07	0 17	0 30	0 33	0 34	0 37	0 39	0 38	0 28	0 22			
Kingston .....				0 04	0 25	0 26	0 41	0 48	0 45	0 44	0 45	0 32	0 05			
Ottawa .....				0 01	0 28	0 28	0 34	0 40	0 40	0 42	0 40	0 29	0 03			
Montreal.....				0 05	0 23	0 32	0 37	0 32	0 26	0 29	0 35	0 12	0 00			
Quebec.....				0 01	0 19	0 25	0 26	0 31	0 32	0 35	0 31	0 23	0 02			
Fredericton .....				0 04	0 24	0 33	0 36	0 41	0 36	0 34	0 34	0 21	0 08			

	Victoria.	Nanaimo.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Woodstock.	Toronto.	Lindsay.	Barrie.	Gravenhurst.	Kingston.	Ottawa.	Montreal.	Quebec.	Fredericton.
Mean proportion for month (Constant sunshine being 1.)	0 20	0 15	0 10	0 27	0 18	0 28	0 15	0 31	0 26	0 25		0 29	0 33	0 29	0 28	0 24	0 28
Difference from average.....	0 01	—	0 07	0 04	0 07	0 06	0 20	0 06	0 02	0 00		—	0 06	0 01	0 01	—	0 04
Maximum daily amount.....	0 80	0 88	0 59	0 95	0 70	0 86	0 85	0 92	0 80	0 96		0 90	0 90	0 85	0 91	0 85	0 92
Date.....	24	24	21	9	1	23	2	7	28	8		8	8	25	23	8	8
No. of days completely clouded	10	17	20	14	13	9	17	11	7	15		10	6	9	8	14	11

## FORECASTS FOR NOVEMBER, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 998. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba.....	79	61	11	7	84.2
Lake Superior.....	106	71	25	10	78.8
Lower Lake Region.....	105	76	22	7	82.9
Georgian Bay.....	105	78	17	10	82.4
Ottawa Valley.....	100	79	13	8	85.5
Upper St. Lawrence.....	100	79	14	7	86.0
Lower St. Lawrence.....	104	84	13	7	87.0
Gulf.....	105	79	21	5	85.2
Maritime Provinces, West.....	97	71	18	8	82.5
Maritime Provinces, East.....	97	72	14	11	81.4
Total.....	998	750	168	80	83.6

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,  
*Director.*

Meteorological Office, Toronto,  
24th December, 1902.

METEOROLOGICAL SERVICE, DOMINION OF CANADA

# Monthly Weather Review.

VOL. XXVI

DECEMBER, 1902.

No. 12

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## REMARKS UPON THE WEATHER.

On the Islands of British Columbia the weather continued dull and cold throughout the greater portion of the month, and the range of temperature between the first and last day was exceedingly small. Rain occurred frequently, but the quantity varied considerably with the district. Frosts were frequent, but they were mostly light, and on the 31st roses and other flowers were still in bloom. Over the Lower Mainland the conditions were somewhat similar, but frosts were more frequent. Over the Upper Mainland, although the temperature often rose above the freezing point, more especially after the 21st, the weather was unusually dull and cold during the greater portion of the month. The precipitation, which varied considerably in quantity, was mostly snow, and there was good sleighing throughout the month.

In the North-west Territories the weather was exceedingly cold up to the 16th, the temperature falling well below zero each day at many places. Somewhat higher temperatures then occurred, and continued for four or five days, when it again turned cold, and remained so with little change to about the 29th. In southern districts there was much fine, bright weather, and the precipitation was generally light, whilst in northern localities it was exceedingly dull, and in most places there was more snow. In Alberta chinook winds continued from the 12th to the 20th, when much of the snow was melted and the ground was bare in some places.

Throughout the greater portion of the month the weather was unusually cold in Manitoba, excepting from the 15th to 20th, when the daily minimum temperatures were generally above zero. During this period, also on or about the 31st, the temperature rose above 32° in southern districts, and although there was fair sleighing to the end of the month, some of the snow was melted. Clouded skies were somewhat more frequent than usual, and in most localities the precipitation was excessive.

In Ontario the weather was mostly fine and comparatively mild during the first week, after which it was dull and cold to about the 15th, when higher temperatures were recorded. A few days later more sunshine also occurred and continued intermittently to the end of the month. From the 8th to 15th, temperatures well below zero were recorded at most places. In the southern portion of the province there were several light falls of snow, but most of it soon disappeared, whilst in northern districts there was enough for sleighing throughout the month.

In the Province of Quebec moderately cold weather was general up to the 4th, after which much lower temperatures prevailed, the minimum being generally below zero each day up to and including the 15th. From the 16th to 22nd much higher temperatures were recorded, and although it again turned cold after the latter date it was not so severe. There was much bright sunshine, more especially during the first half of the month, but high winds were frequent, and the snow, which was from 14 to 21 inches in depth, was much drifted.

The weather in New Brunswick followed much the same sequence with regard to the temperature as in Quebec, but after the 15th it was much milder, the temperature rising above the freezing point almost daily. Clear and clouded skies alternated frequently throughout the month, and there was much sunshine. After the 15th the snow soon disappeared, and on the 31st the ground was bare throughout the greater portion of the province.

In Nova Scotia comparatively mild weather prevailed during the first seven or eight days, after which it was somewhat colder up to the 15th, temperatures below zero occurring upon several days. During the second half of the month much milder weather prevailed. Clouded skies with frequent snow or rain were general, the only distinctly fine weather occurring during the first four days; also from the 12th to 16th, and on or about the 29th. The snow which fell was soon melted after the 15th, and on the 31st the ground was bare in most districts. High winds were quite frequent.

The weather in Prince Edward Island was much the same as that in New Brunswick, but the cold which prevailed during the second week was less severe. Throughout the greater portion of the month the sky was overcast, but the precipitation was deficient, and there was little snow on the ground on the 31st.—F. F. PAYNE.

### ATMOSPHERIC PRESSURE.

Pressure was about average throughout the Dominion, except from the Rockies to the Pacific, where it was below. The largest excess was in Manitoba and New Ontario, whilst the largest deficiency was over British Columbia. The maximum positive departure reported was 0.16 of an inch at White River, Ont., and the minimum negative departure, 0.14 of an inch, at both New Westminster and Barkerville, B.C. Minnedosa and Winnipeg, Man., reported the highest mean barometer, 30.140 inches, and Port Simpson, B.C., the lowest, 29.637 inches.

### HIGH AREAS.

The paths of twelve high areas can be traced with a fair degree of certainty. The first of these areas was over the Southern and Middle States during the last few days of November, and on the 1st and 2nd of December was dispersing as it passed slowly seaward from the Middle States. Of the other eleven, four were first observed near the California Coast, two of them subsequently passing across the continent to the Southern States, then more to the north-eastward with diminishing energy, and two were merged in the other areas which had apparently formed over the Canadian North-west Territories. Of the five areas first observed in the North-west, three passed eastward across Northern Canada, one directly over the more southern portions of the Great Lakes, and one south-eastward, passing quite to the southward of the lakes, and then off the Middle Atlantic Coast. One which was, perhaps, the most important of all, was first observed over the Territory between Hudson's Bay and Lake Superior, and moved south-east and east to the Maritime Provinces, accompanied from its commencement by a developing cold wave which was severe in Quebec and the Maritime Provinces. A marked feature of the high areas from the North-west Territories was a pronounced intensifying of the accompanying cold wave over Northern Ontario and Quebec, and this was also noticeable when the centre of one of the Pacific Coast areas, before mentioned, was passing across the Middle States.

### LOW AREAS.

Ten low areas have been tracked, and eight of them caused gales either on the Great Lakes or on the Canadian Atlantic Coast. Three of the most pronounced were first observed near the Western Coast of the Gulf of Mexico; one first showed indications of decided energy when centered in Indian Territory, but may probably be identified with an area which had entered British Columbia from the Pacific and moved south-east. One apparently developed in the Missouri Valley and moved quickly across the Great Lakes and St. Lawrence Valley. Of four areas, which can be distinctly traced from the Canadian North-west, two were far north and did not greatly affect Canadian weather, one moved briskly across the Dominion, giving precipitation and moderate gales, and one, which, while in the North-west, appeared very important, moved very slowly across the Great Lakes with diminishing energy, but off the Atlantic Coast there was a subsidiary formation, and gales with snow or sleet became general in the Gulf of St. Lawrence and Maritime Provinces. The two first areas of the month were also the two most important, and the first of these was that mentioned above as showing decided energy over Indian territory. During the 2nd, with still increasing energy, it moved north-eastward, causing a heavy easterly gale with rain on the Great Lakes. Moving eastward from Ontario it gradually filled up, and while precipitation was general, the accompanying winds were not heavy. The other was first observed near the West Coast of the Gulf of Mexico, and on the 4th moved rapidly north-eastward across the United States; on the fifth it passed off the New Jersey Coast and passed to the southward of Nova Scotia, while heavy gales with snow and sleet prevailed throughout the Maritime Provinces and northward into the Gulf. The path of the storm was so far to the southward of the Great Lakes that the accompanying snowfall which was heavy a little to the southward did not extend into Canada, but moderate north-east gales prevailed on Lakes Erie and Ontario.

### PRECIPITATION.

The precipitation was considerably above the average over the greater portion of the Maritime Provinces, the excess at Sydney amounting to 3.8 inches. In Quebec there was a small deficiency in the western part,



while elsewhere in the province the precipitation was average or a little above. In Ontario, except in a few isolated localities, the average was not maintained, but the negative departures were only locally large. In Manitoba and the Territories, where the precipitation was almost wholly snow, the average was very generally exceeded, but in some few localities was not quite reached. In British Columbia, differences from average were not pronounced. At the close of the month snow to a depth of 20 inches lay on the ground in Cariboo in British Columbia. The Territories and Manitoba were well covered, especially Saskatchewan, where the depth was 12 inches and over. In Northern Ontario and over Quebec the depth was from 14 to 24 inches. In the Peninsula of Ontario there was very little—not enough for sleighing in many localities. In the Maritime Provinces the heavy snowfall of the first half of the month had pretty well disappeared, and the ground was bare except in parts of New Brunswick.

#### WINDS.

In British Columbia, on Vancouver Island, and over the Lower Mainland the direction was if an thing in favour of the south and east. The wind mileage was excessive; there were at least five gales, and besides there were twenty-two days on which either a fresh or strong breeze was experienced.

In the North-west Territories the south and west directions predominated. Four gales were recorded, and ten days of strong and ten days of fresh breezes were experienced.

In Manitoba the direction was chiefly between the south west and north. Three gales were experienced, and eight days of strong and eight days of fresh breezes.

In the Lake Region the direction favoured the west and north. The force of a gale was recorded ten times, and there were besides eight days with strong and seven with fresh breezes.

In the Ottawa and St. Lawrence Valleys the direction was largely west to north; the force of a gale was reached on five or more occasions, and fresh to strong breezes were of almost daily occurrence.

In the Gulf of St. Lawrence the direction was almost entirely westerly to northerly. There were seven gales and eight days with strong and six with fresh breezes.

In the Maritime Provinces the direction was also almost entirely westerly to northerly. There were seven gales and eight days of strong and nine of fresh breezes.

In the Maritime Provinces where winter navigation is pursued the gales occurred between the 5th and 6th, between the 8th and 9th, between the 10th and 11th, on the 14th, between the 16th and 17th, and on the 22nd and 26th. These storms were all warned excepting the moderate gale which prevailed between the 16th and 17th.

In the Lake Region the display of storm signals was discontinued for the season on the 7th.

#### BRIGHT SUNSHINE.

Bright sunshine was in excess of the average in Ontario and New Brunswick, while in other provinces it was somewhat deficient. The highest percentages registered were 31, 33 and 35 at Toronto, Brandon and Fredericton respectively, and the lowest were 7, 11 and 17 at Agassiz, B.C., Victoria, B.C., and Indian Head, N.W.T. The largest positive departure from average was 8 per cent at Toronto, and larger negative, 8 per cent, at Agassiz.

#### TEMPERATURE.

The temperature was below the average in all portions of the Dominion. The most marked negative departures occurred in the North-west Territories and over the eastern and northern parts of British Columbia, and varied from 6 to 10 degrees; and the next largest departures were over the greater portion of Ontario and in western Quebec and the western part of New Brunswick, and ranged from three to 5 degrees.

*The Highest and Lowest temperatures in each Province during December, 1902, were:*

British Columbia,	66°·5 on 26th at Clayoquot.	—35°·9 on 10th at Stuart Lake.
North-west Territories,	55°·0 on 16th at High River.	—40°·0 on 25th at Crescent Lake.
Manitoba,	37°·5 on 19th at Minnedosa.	—40°·4 on 25th at Brandon.
Ontario,	50°·5 on 2nd at Dunnville.	—38°·0 on 26th at St. George.
Quebec,	44°·0 on 1st at St. Agathe des Monts.	—35°·5 on 13th at Cap-à-Blanc.
Nova Scotia,	65°·0 on 17th at Moncton.	—35°·0 on 13th at Sussex.
New Brunswick,	55°·5 on 22nd at Bridgetown.	—20°·5 on 13th at Truro.
Prince Edward Island,	47°·5 on 23rd at Hamilton.	6°·3 on 9th at Charlottetown.

• Stations not furnished with Registering Thermometers.  
a. Barometer not reduced to Sea Level.

*u.* Barometer not reduced to Sea Level. • Stations not furnished with Registering Thermometers.

LATITUDE N.	LONGITUDE W.	PRESSURE.			TEMPERATURE.			HUMIDITY.			WIND.			PRECIPITATION.			No. of Foggy Days.	No. of Thunderstorms.	No. of Fair days.	Days with Hurricane.				
		Elevation above Sea Level, in feet.	Mean reduced.	Highest.	Lowest.	Difference from average.	Hours observed.	Highest.	Lowest.	Date.	Mean daily.	Mean temperature of air.	Mean amount of cloud.	No. of days completely clouded.	DIRECTION OF WIND FROM						Amount.	Difference from Average.	Heaviest fall in month.	
															N.	E.								S.
BRITISH COLUMBIA.																								
Victoria.....	48° 33' 123 16	5	29.92	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Barkerville.....	43° 12' 121 35	4100	29.82	30.58	29.21	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Astoria.....	46° 14' 121 35	52	29.82	30.58	29.21	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Port Simpson.....	61° 14' 121 35	52	29.82	30.58	29.21	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Revelstoke.....	51° 06' 122 43	1176	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Kamloops.....	49° 12' 120 29	1193	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Princeton.....	49° 12' 120 29	1030	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Pilot Bay.....	49° 30' 126 55	20	29.79	30.32	29.01	1.2	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Rover's Lake.....	51° 30' 127 15	20	29.79	30.32	29.01	1.2	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Stuart Lake.....	54° 55' 124 15	1800	29.79	30.32	29.01	1.2	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
French Creek.....	49° 20' 124 56	1246	29.82	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Columbia.....	50° 14' 119 15	1246	29.82	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Chilliwack.....	49° 10' 123 57	21	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Port Bobs.....	49° 14' 121 57	21	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Midway.....	50° 02' 118 45	1800	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Endorby.....	50° 52' 119 15	1180	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Nicola Lake.....	49° 09' 121 30	2120	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
West Kootenay.....	49° 12' 127 30	1900	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Garry Point.....	49° 31' 123 17	2000	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Tobacco Plains.....	49° 11' 123 15	1900	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Vancouver.....	49° 07' 123 55	150	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
New Westminster.....	49° 12' 122 55	300	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
αLadner.....	49° 05' 123 4	30	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
North Nicomen.....	49° 12' 122 5	30	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Quesnelle.....	52° 50' 122 30	1700	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Clayoquot.....	49° 11' 125 47	40	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Massett.....	49° 30' 115 50	30	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Grassbrook.....	53° 58' 132 9	30	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Ballton.....	52° 40' 126 55	2775	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Pella Gola.....	52° 40' 126 55	150	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Dunsmuir.....	48° 45' 123 12	40	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Nelson.....	49° 27' 117 23	21	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Matsoni.....	49° 12' 122 16	21	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Okanagan Mission.....	49° 52' 119 29	300	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Abneri.....	49° 15' 121 10	300	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Saturna Island.....	48° 17' 123 12	14	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Kaslo.....	49° 52' 117 0	4072	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Cape Scott.....	50° 38' 128 57	4072	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Glacier.....	51° 14' 117 20	2500	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Golden.....	51° 16' 117 20	2500	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Spencer's Bridge.....	51° 16' 117 20	2500	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
S. W. TERRITORIES:																								
Medicine Hat.....	50° 1' 110 37	1161	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Edmonton.....	53° 33' 113 30	2158	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Swift Current.....	50° 20' 107 45	2420	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Qu'Appelle.....	50° 30' 103 47	2115	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Calgary.....	51° 2' 114 2	3589	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Prince Albert.....	52° 10' 106 0	1629	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Brattleford.....	52° 41' 108 20	1430	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Conkup.....	53° 30' 110 20	4512	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
αBanff.....	53° 10' 115 35	4512	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Chaplin.....	50° 27' 106 40	2292	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Moose Jaw.....	50° 21' 106 35	1745	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			
Regina.....	50° 27' 104 37	1855	29.92	30.36	29.50	1.06	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02	10	22.5	30.15	29.58	1.02			

## N.-W. TERRITORIES—(con.)

[illegible]

## ANALYSIS:

MANHATTAN :	50 15	49 50	1600 30	14 30	28 29	54 1 24	3 0	3 7	19 37 5	18 36 3	35 20 5	.....	5	1	3	0	4	2	2	8	11	58	62	.....	16 3	27 3 4	0 72	0 10 0 15	12 19	1 0 0		
Minniska	49 53 97	7 500 30	11 30	62 29	52 1 30	4 5	0 5	29 35 2	31 30 1	25 19 1	.....	5	5	2	4	3	1	11	6	5	9	21	62	.....	35 2	24 8 W	1 50	0 60 0 40	9 20	0 0		
Winnipeg	49 53 97	11 56	.....	.....	.....	2 1	3 9	16 34 0	18 30 0	35 1	.....	.....	4	4	8	15	7	2	1	7	19	20	13	93	1	IV	4 8 E	0 30	0 70 0 60	4 27	0 0 0	
*St. Albans (Newmo)	49 53 97 11	710	.....	.....	.....	2 1	1 2	16 30 0	18 33 0	25 12 0	.....	.....	5	8	12	2	11	3	38	0	10	17	0	93	IV	VII	9 8 W	0 40	0 9 0 15	5 56	0 0 0	
Brandon	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Chapel Island	49 53 97 33	.....	.....	.....	.....	3 4	4	16 31 0	18 31 0	25 13 1	.....	.....	5	6	3	2	3	4	29	10	8	6	26	3	93	8 9	21 2	24 8 W	0 80	0 20 0 0	5 24	0 0 0
Elkhorn	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Stony Mountain	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
St. Mary	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Traverse	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Hillview	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Almestrop	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Prescott	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Lawson	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Lawson	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Oakbank	49 53 97 33	.....	.....	.....	.....	3 4	2	0 30 0	18 31 0	25 19 3	.....	.....	5	6	1	3	4	4	9	11	0	13	3	48	II	V	27 8 E	0 80	0 14 0 30	5 24	0 0 0	
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
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Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....	0 90	0 20 0 30	2 28	0 0				
Portage la Prairie	49 57 98 1	830	.....	.....	.....	5 2	2	14 35 0	31 25 0	24 17 5	.....	.....	6	2	5	10	5	10	5	1	25	7	62	.....</								

ONTARIO:

[illegible]





PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING  
DECEMBER, 1902.

STATIONS.	RAINFALL.					SNOWFALL.					REMARKS.
	Amount in inches.	No. of Days or Over.	No. of Fair Days.	Heaviest Fall in Month	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month	Date.		
<hr/>											
BRITISH COLUMBIA—											
Copitlam .....	12.07	17	13	2.04	24	1.0	4	1.0	5		
Royal Oak .....	9.72	17	12	1.75	23	3.0	2	1.5	11		
Nas Harbour .....	3.56	5	12	2.53	16	89.0	15	16.0	30		
Port Essington .....	13.71	11	13	5.58	17	37.2	13	6.0	26		
Nanaimo .....	8.43	14	17	2.80	24-25	4.0	2	2.0	24		
Kuper Island .....	8.98	25	6	1.50	24	16.3	3	9.2	24		
Goldstream Lake .....	11.23	15	10	2.49	24	53.0	12	10.0	24		
Caulfields .....	8.80	24	7	1.43	24						Sleet on 2 days.
<hr/>											
N. W. TERRITORIES—											
Salteaux .....			26			17.0	5	10.0	25-26		Blizzard 25, 26.
Broomhill .....			29			2.0	2	1.5	1		
Bruderheim .....			29			2.0	2	2.0	3-4		
Victoria .....			28			5.0	4	3.0	4		Aurora 13, 24 ; 24,—45.
Regina .....			26			2.3	4	2.0	4		Blizzard 23.
Dirt Hills .....			28			2.0	3	1.0	4		
Weyburn .....			27			13.0	4	5.0	27		Bad blizzard 23.
Stirling .....			25			10.0	6	6.0	23		
Innisfail .....			28			1.0	3	0.5	5		
Beaver Hills W. ....			22			7.9	9	3.2	3-4		
Willow Branch .....			23			8.0	8	3.5	1		Blizzard 22.
Beaver Hills E. ....			25			6.8	6	3.5	4		
<hr/>											
ONTARIO—											
Wyoming .....	1.20	2	24	0.80	22	13.0	5	6.0	27		Ploughing stopped 2.
Watford .....	1.90	2		1.05	21						No snow recorded.
Ennisdale .....	0.82	3	15	0.69	21	31.8	13	6.0	2		
Georgetown .....	1.51	5	12	0.59	2	18.6	17	9.0	13		Fog 14, 16, 21.
Warton .....	1.44	4	13	0.78	3	25.0	15	9.0	7		
Seneca .....	1.15	7	8	0.48	16	11.5	15	7.0	13		
Emmetsburg .....						8.0	4	3.0	6		
Sunshine .....	0.86	7	16	0.30	21	15.7	8	1.0	7		
Providence Bay .....	0.78	3	21	0.58	21	21.0	8	6.0	16		
Dealtown .....	1.68	8	19	0.64	2	8.5	6	4.0	13		
Aurora .....	0.52	4	20	0.27	21	10.1	8	2.6	24		
Niagara Falls .....	1.19	6	19	0.40	21	15.0	6	8.0	13		
Ursa .....	0.96	3	14	0.42	16	31.0	11	8.0	2		11, 12.
Westport .....	0.54	3	21	0.32	2	17.0	7	4.0	9		
Oliver's Ferry .....	0.13	1	25	0.13	22	9.0	5	3.0	13		
Lion's Head .....	1.56	4		0.91	3						No snow recorded.
Princeton .....	1.58	5	17	1.23	21-22	12.0	9	3.0	29-30		
Westminster .....	1.04	5	23	0.41	21	15.0	3	11.0	7-8		
Craigleith .....	3.47	3	11	1.57	29	24.7	14	3.7	3		
Montague .....	0.68	2	20	0.39	21	11.0	9	3.0	26-27		9, 20.
Wooler .....	1.31	3	18	0.52	21	11.5	10	3.0	13		
Port Burwell .....	1.44	8	22	0.54	16	14.0	6	7.0	26-27		Fearful gale 26, 27.
Goderich .....	0.60	2	23	0.40	15	13.5	6	4.0	29		
Jennyn .....	0.71	2	24	0.41	21	16.0	4	6.0	13		9, 4.
Dutton .....	2.20	4	21	1.50	15	6.5	6	2.0	13		
Scarboro' .....	1.44	5	15	0.58	16	12.0	12	5.0	13		
Huntsville .....	0.25	1	22	0.25	16	20.0	8	8.0	3		
Parma .....	2.19	4	20	0.56	16	21.0	7	5.0	26		
Uxbridge .....	0.53	3	19	0.35	21	11.5	9	2.5	7		8, 6 ; 14,—18.
Orangeville .....	R	0	12			16.7	19	5.0	3		
Deer Park .....	1.38	4	23	0.55	15	6.5	4	3.8	13		
Newburgh .....	0.79	4	18	0.47	3	17.5	9	6.0	25		
Arlan .....	1.16	5	16	0.62	22	29.0	10	1.0	30		
Lansdowne .....	1.87	4	23	0.95	16	6.0	4	1.0	26-27		
Midland .....						13.5	6	1.5	8		
Croydon .....	0.95	2	24	0.55	22	15.5	6	6.0	30		
<hr/>											
NEW BRUNSWICK—											
Point Escuminac .....	0.87	4	20	0.43	17	18.1	7	4.2	26		
<hr/>											
NOVA SCOTIA—											
Port Morden .....	3.43	8	18	1.17	29-30	13.0	7	4.0	10		

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE  
SUN WAS ABOVE THE HORIZON IN THE MONTH OF DECEMBER, 1902.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria				0 00	0 00	0 02	0 15	0 24	0 20	0 16	0 13	0 03	0 00			
Nanaimo				0 00	0 03	0 14	0 15	0 19	0 20	0 23	0 11	0 02	0 00			
Agassiz				0 00	0 00	0 02	0 09	0 12	0 12	0 10	0 09	0 02	0 01			
Battleford				0 10	0 23	0 30	0 32	0 30	0 35	0 31	0 20	0 00	0 00			
Indian Head				0 00	0 00	0 06	0 14	0 26	0 30	0 37	0 27	0 04	0 00			
Brandon				0 00	0 16	0 33	0 45	0 59	0 54	0 47	0 19	0 00	0 00			
Winnipeg																
Woodstock				0 00	0 11	0 21	0 31	0 35	0 34	0 27	0 16	0 06	0 00			
Toronto				0 00	0 14	0 39	0 43	0 44	0 42	0 41	0 31	0 23	0 01			
Lindsay				0 00	0 09	0 17	0 35	0 38	0 41	0 32	0 19	0 14	0 03			
Barrie																
Gravenhurst				8	0 25	0 29	0 40	0 40	0 42	0 39	0 42	0 34	0 14			
Kingston				0 00	0 11	0 30	0 33	0 35	0 38	0 36	0 32	0 20	0 02			
Ottawa				0 00	0 00	0 15	0 25	0 31	0 32	0 25	0 35	0 17	0 00			
Montreal				0 01	0 10	0 26	0 31	0 30	0 26	0 31	0 23	0 07	0 00			
Quebec				0 06	0 22	0 31	0 35	0 41	0 35	0 27	0 08	0 00	0 00			
Fredericton				0 00	0 16	0 40	0 46	0 51	0 51	0 42	0 40	0 24	0 00			
Mean proportion for month (Constant sunshine being 1.	0 11	0 13	0 07	0 26	0 17	0 33	0 21	0 31	0 23	0 33	0 27	0 21	0 24	0 24	0 35	
Difference from average..	0 05	—	0 08	0 02	0 07	0 02	0 01	0 08	0 02		0 02		0 02		0 01	
Maximum daily amount	0 63	0 70	0 67	0 92	0 64	0 79	0 61	0 87	0 94	0 93	0 84	0 73	1 00	0 82	0 88	
Date..	9	9	11	12	2	18	31	8	23	8	14	4	20	9 20	2	
No. of days completely clouded	16	20	25	14	17	9	16	10	16	10	13	15	14	13	12	

*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given (I) being the brightest, (IV) the feeblest in brilliancy.

- 13. Victoria, Alta.
- 22. Cape Magdalen.
- 23. Minnedosa, Ill.
- 24. Victoria, Alta.

## FORECASTS FOR DECEMBER, 1902.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 1145. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			Percentage
		No. Fully	No. Partly	No. Not	
Manitoba, .....	93	61	20	12	76.3
Lake Superior .....	101	75	19	10	81.3
Lower Lake Region, ...	127	94	22	11	82.7
Georgian Bay .....	126	85	27	14	78.1
Ottawa Valley, .....	119	83	19	17	77.7
Upper St. Lawrence .....	120	78	30	12	77.5
Lower St. Lawrence .....	112	89	14	9	85.7
Gulf .....	97	70	15	12	80.9
Maritime Provinces, West, .....	123	82	22	19	75.6
Maritime Provinces, East, ..	124	88	21	15	79.4
Total .....	1145	805	209	131	79.4

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,  
*Director.*

Meteorological Office, Toronto,  
26th January, 1903.

In the *November Review* the lowest temperature at Dawson is stated as  $48^{\circ}$   $\pm 0$ , it should read  $-48^{\circ}$   $\pm 0$ .











	P		
Author	Canada.	Meteorological Service.	Astron. Can.
Title	Monthly weather review 1902		

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